



HEALTH AND SAFETY EXECUTIVE
Asbestos Analyst Inspection Programme

Report on the Asbestos Analyst Inspection Programme 2015

Carried out by the Health and Safety Executive

**This report and the work it describes involved the Asbestos Licensing Unit
and FOD Regulatory and Specialist (Occupational Hygiene) Inspectors.**

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EXECUTIVE SUMMARY

Background

1. Effective cleaning and clearance of an asbestos removal site is a legal requirement after licensed work and a critical part of the process. It is essential that cleaning is effective not only to ensure there are no remaining asbestos materials but also to maintain public confidence. A clean site will eliminate future asbestos exposures and risk to the health of occupants.
2. Previous inspection studies and anecdotal evidence from UKAS have indicated that independently audited four stage clearance (4SC) procedures produce more clearance failures compared with unchecked activities. Concerns have also been expressed about several other 4SC matters including: the extent of additional cleaning by analysts before a clearance pass, discrepancies in sampling and analysis procedures and personal protective clothing (PPE). There has also been concern over the quality of personal sampling carried out for licensed contractors.
3. The broad aims of this study in 2014/15 were to:
 - Obtain a picture of current analyst work and the nature and scale of organisations carrying out clearance inspections.
 - Investigate the areas of concern by examining analyst work practices, policies, processes, health and safety arrangements and 4SC procedures.
 - Develop HSE's skills and knowledge in regulating this area including providing a broader insight into the work and practices of asbestos removal licensed contractors.

Method

4. Initial letters and a questionnaire were sent to all UKAS accredited analyst testing organisations (~140 (2013 data)). This was followed up by carrying out a number of analyst head office visit interviews (22 interviews) and a number of site inspections during 4SCs (20 inspections). A representative range of analyst organisations (size, location etc) were selected for the visits. In total, information was obtained from ~70% of analyst organisations and ~15% of organisations received a head office and inspection visit. Enforcement action was taken where appropriate.

Main Findings

5. There are around 30 large analyst organisations employing over 40 individual analysts. Forty five organisations employ between 30 and 40 analysts. Some 31 and 13 organisations carry out more than 500 and 1000 4SCs respectively per annum (2013 data) accounting for some 66% of all 4SCs (around 23000 clearances in 2013). In contrast, some 19 organisations performed less than 100 4SCs including two analysts who conducted less than 10 clearances in 2013.
6. The self-reported evidence suggested that unmonitored 4SCs are failed on a relatively infrequent basis. Most analysts (~75%) indicated that they fail jobs between 1-20% of occasions. Around 10% of analysts indicated that they never fail clearances. Two percent stated that they fail jobs on most occasions (>81%).

7. The data gives a mixed picture on who engages the analyst. In most cases, it is a combination of clients and licensed contractors albeit in varying proportions. On balance however, the data suggests clients may engage the analyst on more occasions than the licensed contractor. Around 42% of analysts are engaged by the client in most jobs (81-100%) while only around 25% of analysts are engaged by the licensed contractor in most jobs (81-100%). Overall, the data suggests analysts are directly employed by the client in more than half of all jobs.

8. Analysts mostly conduct one (~68%) or two (~30%) 4SCs per day. There are occasions when three or more 4SCs will be carried out per day. Most analyst organisations (>80%) only conduct multiple clearances infrequently (<5days per year) but four analyst organisations conducted multiple clearances on more than 20 days per year.

9. Analysts carry out substantial cleaning of enclosures/removal areas to achieve a successful clearance of the site. Almost all laboratories reported that some remedial work was always required to allow enclosures to pass at stage 2 of the 4SC process. In many instances, the analyst would carry out "minor" cleaning themselves to allow the job to proceed. In most cases, remedial work and failures were not documented. Often the licensed contractor supervisor was not on site to accompany the analyst during the visual inspection.

10. Some analysts wore domestic clothing under their coveralls. A number of analysts thought (incorrectly) that the requirement not to wear domestic clothing underneath was new and that there had been changes to the "legislation". A number of organisations changed their internal procedures as a result of the study. Enforcement during onsite inspections was focused on the wearing of domestic clothing underneath protective coveralls.

11. Several analysts did not perform appropriate personal decontamination procedures on leaving the enclosures. In many cases there were no written procedures and no practical training on decontamination.

12. Personal sampling of licensed contractor employees was found to be extremely short duration (10-30minutes). A number of analysts reported that licensed contractors were only willing to pay for the minimum sampling time to comply with the legal requirement to carry out air sampling. Also very limited contextual information was reported to assist interpretation of the results.

13. All the analyst organisations operated quality control systems and were subject to independent auditing on an annual basis as part of their UKAS accreditation. Many organisations also carried out additional auditing including employing external auditors who would carry out "surprise" visits. Internal auditing and checking processes were considered reasonable for the analysts visited, with all laboratories exhibiting a genuine need to get things right.

14. A number of companies commented that standards would be substantially improved if the analyst was involved from the start of the work for example acting in a project management role. Most companies suggested that clear and unambiguous lines of communication between the licensed asbestos removal contractor, the client or property owner and the analyst at an early stage in the process were essential to raising standards.

15. A few organisations said that standards in the removal industry had hardly improved at all over recent years partly due to time and financial pressures on licensed contractors but also as a result of poor training and equipment.

16. Almost all the participating analyst organisations recommended that the analyst should only be employed by the property owner or client as a means of improving standards and some thought that this should be mandatory.

17. A number of analysts suggested that there was a lack of trained and experienced supervisors which was a concern. Around 25% of analyst organisations provided photographic evidence to support their 4SC documentation in 2015.

18. Some quality systems were very sophisticated in nature and featured bespoke IT systems for recording and reporting. The use of onsite recording and communication equipment was noted.

19. A number of the 4SC certificates supplied by analysts were incomplete; for example the time taken to carry out stage 1 was not included. Contextual information was considered to be lacking in many of the reports provided, though, it is acknowledged that additional information may be available from other laboratory sources including analysts own note books. (The analysts only supplied the records that were requested in the study protocol.)

20. The results of background monitoring were judged to be good with analysts using workplace plans to illustrate the sampling positions, some contextual information provided and based on typical sampling times of 30-60 minutes. All of the records examined as part of the study showed recorded values less than the clearance indicator of 0.01f/ml.

Recommendations

The Analyst Inspection Programme has identified that there needs to be more rigorous and robust systems in various areas of analyst work particularly regarding health and safety matters, personal monitoring, analyst engagement for the 4SC and for carrying out the 4SC process. There also needs to be high standards of quality control. The following recommendations are made in these respects:

(i) Analysts should be involved in the scoping stage of the licensed removal work to ensure that a suitable plan of work (POW) can be prepared and that sufficient resources can be allocated for the 4SC. This should be achieved through a pre-removal site visit. If this is not practical, then the analyst must be provided in a timely manner with a copy of the contractor's POW or sufficient detail on the nature of the work eg site layout and complexity (including voids, ducting, cavities, ledges, cabling etc), ACMs involved (quantity type etc), access etc. This is a formal contractual arrangement and the property client and licensed contractor have legal duties to cooperate with the analyst and to provide the analyst with adequate information in a timely manner (see paragraphs 6.20-6.22)).

(ii) In view of the potential for 4SC failures, analysts should ensure that the contractual arrangements with their "employer" (ie the property client or the licensed contractor) includes provision for additional site time and charges to cover delays and further 4SCs caused by inadequate licensed contractor cleaning (see paragraph 6.9).

(iii) The analyst should not start the 4SC until a completed Handover Form has been received from the licensed contractor (see paragraph 6.7). The form must be satisfactory.

(iv) There should be a time limitation on the extent of cleaning by the licensed contractor that is acceptable during the 4SC. The time should be limited to a maximum of 10 minutes and when exceeded, the analyst should formally issue a failure certificate (further details are given in paragraph 6.8).

(v) Photographic evidence should be provided in clearance certificates to verify/substantiate clearance inspection results/standards and site conditions. The photographs will provide considerable reassurance to clients for subsequent reoccupation of the building. Photographs will also provide greater robustness to analyst's work and the 4SC process.

(vi) Employers should provide clear written procedures on the nature of clothing that should be worn for clearance work. Domestic clothing should not be worn inside enclosures. There should also be clear written decontamination instructions including descriptions explaining when full and preliminary decontamination procedures are appropriate. Practical training on decontamination procedures must also be provided.

(vii) Discrepancies, deficiencies and omissions identified in the Inspection Programme should be addressed through a combination of improved quality control and assessment and auditing, and through refresher training, coaching and instructing. The work of all analysts in the organisation should be continually assessed. A regular programme of on-site monitoring/auditing/re-inspection (ie joint visits) should be carried out. It is recommended that ~5% of all 4SCs are audited/re-inspected and that every analyst should be audited/re-inspected at least 4 times per annum (with reasonable intervals between re-inspections for individuals). The 4SC site auditing/re-inspection should be thorough and include all stages. Stages 2 and 4 re-inspections should be performed immediately after the analyst has conducted the visual inspections. In addition, at least 5% of 4SC certificates for occupation should be reviewed in desk top studies. More details are presented in paragraphs 6.16-6.17 and Tables 1-2.

(viii) The analyst should advise the licensed contractor on effective and meaningful personal sampling (duration and activities to be covered) and on the extent of contextual information to be collected (more details in paragraphs 6.24-6.28).

(ix) It is recommended that this Analyst Inspection programme is repeated after the introduction of the revised Analyst Guide (HSG248).

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1. INTRODUCTION

1.1 Asbestos products have been widely used as construction materials for many years particularly in new or refurbished buildings during the post war period between 1950 and 1980. These asbestos-containing materials (ACMs) can be found in all types of premises including industrial and commercial buildings, hospitals, schools, department stores, municipal and community buildings as well as in domestic houses and flats. Asbestos products include asbestos coatings for fire protection, asbestos insulation for heat or acoustic insulation, asbestos insulating boards (AIB) as fire breaks and ceiling tiles and asbestos cement as profiled sheets for roofs and walls.

1.2 Asbestos fibres are released when ACMs are physically damaged or disturbed. Inhalation of these fibres can cause several serious or fatal respiratory conditions including asbestosis (fibrosis of the lung), bronchial carcinoma (lung cancer) and pleural and peritoneal mesothelioma (cancers of the chest lining/chest cavity and abdominal cavity lining respectively). Asbestos exposure is inextricably linked with mesothelioma, a usually fatal condition. Asbestos is classified as a category 1 human carcinogen. Asbestos fibre exposure is the most serious occupational health issue in the United Kingdom.

1.3 Recent figures from the Health and Safety Executive (Health and Safety Statistics 2016/2017 Published November 2018, www.hse.gov.uk/statistics) estimate that that over 5500 people are currently dying every year from asbestos diseases including over 2500 from mesothelioma. The UK has the highest mesothelioma incidence rate in the world.

1.4 There is specific legislation which applies to asbestos ie the Control of Asbestos Regulations (CAR) 2012. These regulations set out a comprehensive range of requirements and duties for identifying, managing and controlling the risks from asbestos. The regulations place specific requirements on works removing ACMs and on the cleaning and clearance of "removal areas". There is also a specific duty under CAR to manage asbestos in buildings to ensure that occupants and those who carry out maintenance work do not come to harm.

1.5 There is no requirement to remove ACMs from buildings. ACMs in good condition and properly managed do not present a risk to occupants and are generally left in place. ACMs may need to be removed if they are damaged and pose a risk to occupants, or are in vulnerable locations. They may also have to be removed to allow refurbishment or demolition work. Asbestos fibre release during removal is unavoidable. Therefore the removal work must be strictly controlled (Regulations 11 and 16) and work areas thoroughly cleaned (Regulation 17). Removal involving higher hazard ACMs (namely asbestos coatings, asbestos insulation and AIB) requires a licensed contractor (Regulation 8). In addition, the removal location needs to be independently checked by a UKAS accredited analyst and a certificate for reoccupation issued to confirm the premises are thoroughly cleaned and safe for reoccupation (Regulation 20).

1.6 Analysts are primarily involved in site clearance certification but they may also be involved in asbestos work other ways. Most analysts carry out sampling and analysis of bulk and air samples. They may also be involved in asbestos removal site management and monitoring eg overseeing the smoke test and carrying out reassurance air sampling and leak testing, and carrying out personal exposure monitoring of operatives performing the removal work.

1.7 Although it is not a legal requirement, it is desirable that the analyst certifying site clearance is employed by the property owner or occupier. This arrangement avoids any conflict of interest (perceived or real) should the analyst be employed by the removal contractor. It also allows an independent party to resolve any problems that arise. In addition, there is a further advantage in that all results and certificates for reoccupation can

be issued directly to the person who has responsibility for the premises as well as to the contractor.

1.8 Clearance certification is vital in the asbestos removal process. The certificate for reoccupation from an impartial, competent organisation provides reassurance and security to subsequent building users and occupiers. Clearance is a multi-stage process of inspection and assessment performed in a structured, systematic and consistent manner.

1.9 The Construction (Design and Management) Regulations (CDM) 2015 also apply to asbestos removal work and to site clearance. The property client commissioning the work and the licensed contractor have duties under the CDM 2015 Regulations. The property client is expected to ensure that adequate resources including time are planned for and are made available. There is a legal duty on the licensed contractor to cooperate with the analyst and to provide the analyst with adequate information in a timely manner.

1.10 Therefore the analyst and the contractor need to work together. The analyst needs sufficient information in order to conduct the 4SC diligently and safely. The analyst needs to be involved in the planning of the work at an early stage. This is discussed more fully in paragraphs 6.20-6.21.

1.11 The contractor and analyst roles must be properly understood. The contractor must thoroughly and diligently clean up the work area after ACM removal. The analyst's role is to provide independent verification that the area is clean and suitable for subsequent use. It is not the analyst's role to oversee the final clean of the area or to perform the cleaning. However, if cleaning issues do arise, the analyst should direct the contractor to those matters which require attention to ensure successful completion of the process. The analyst should allow sufficient time for clearance certification to be performed.

1.12 The site certification for reoccupation procedure involves four distinct stages:

Stage 1: Preliminary check of site condition and job completeness;

Stage 2: A thorough visual inspection inside the enclosure/work area;

Stage 3: Air monitoring with disturbance of settled dust;

Stage 4: Final assessment post-enclosure/work area dismantling.

1.13 Guidance on clearance certification and other activities is set out in "Managing and working with asbestos: Approved Code of Practice and Guidance" (L143). There is also more detailed guidance in the document: "Asbestos: The analysts' guide for sampling, analysis and clearance procedures" (HSG248). This contains guidance on 4SC procedures, quality assurance, training for analysts, bulk sampling and analysis, air sampling and analysis; supervisory work, personal protective equipment and decontamination procedures. The document was initially published in 2005 and is being revised.

1.14 HSE has not undertaken a large-scale assessment or examination of analyst procedures, activities and work practices in the past. Some smaller scale local initiatives have occurred. These studies and other (anecdotal) evidence have indicated that more clearance failures may be recorded during formal auditing compared with routine (ie non-observed) work. In addition, there is anecdotal evidence suggesting that insufficient time may be being allowed for thoroughly visual inspections (stage 2 of the clearance procedure) and for airborne personal sampling. Concerns have also been expressed about several other 4SC matters including: the extent of additional cleaning by analysts before a clearance pass, discrepancies in sampling and analysis procedures and personal protective clothing (PPE). There has also been concern over the quality of personal sampling carried out for licensed contractors.

1.15 There have been some 30000-35000 asbestos removals and clearances conducted annually over last 10 years. Analyst organisations are subject to auditing by UKAS as part of the accreditation process and requirements. The auditing examines the management systems, administrative arrangements and quality control procedures. It will include a usually pre-arranged 4SC site visit. Clearly, the proportion of clearance activities scrutinised or inspected by UKAS is extremely limited and the standard of routine work relies heavily on the integrity, diligence and skill of the individual analyst.

1.16 The purpose of HSE's intervention was therefore to obtain information on the size of analyst organisations and on the range and scale of their activities. The intervention was also designed to examine a nationally statistically valid proportion of analyst organisations on their recent clearance documentation and on their site activities particularly the 4SC. The findings from this study will inform the revision of the Analysts' Guide. More details on the aims and objectives of the inspection intervention are set out in Section 2.

2 AIMS AND OBJECTIVES

AIMS OF THE STUDY:

2.1 The aims of this study were to investigate the work practices of a targeted sample of analyst companies carrying out 4SCs, in order to:

- (i) Obtain a better understanding of how the industry functions;
- (ii) Ensure that high standards of clearance work are being met. Where this is not the case, the problems with individuals will be addressed and the industry-wide issues will be addressed through stakeholder engagement; and
- (iii) Develop HSE's skills and knowledge in regulating this area.

OBJECTIVES OF THE STUDY:

2.2 The objectives of the study were as follows:

- (i) To obtain information from UKAS accredited analyst companies carrying out 4SCs. A questionnaire covered areas such as: numbers of 4SCs carried out by an individual analyst in a working day; internal auditing; rates of 4SC failures; and pricing policies etc.
- (ii) Using the information obtained from these questionnaires, target a number of analyst companies for further inspection.
- (iii) To carry out one Head Office visit and one site inspection for each of the analyst companies selected. CD inspectors were accompanied by Specialist Inspectors (Occupational Hygiene). The purpose of the Head Office visit was to obtain information and documentation regarding work practices, policies and procedures. The purpose of the site visit was to observe the actual work methods of an analyst carrying out a 4SC.
- (iv) To analyse the information obtained to determine what action should be taken regarding individual analyst companies. Individual action will be based on existing guidance, the Enforcement Management Model (EMM) criteria and HSE's Enforcement Policy Statement (EPS).
- (v) To use the findings of the project to inform the industry. This is likely to be done through distribution among industry stakeholder groups such as the Asbestos Liaison Group (now Asbestos Leadership Council); trade and professional bodies including BOHS, NORAC and ATAC; and client groups.
- (vi) To report the findings of the project, and make appropriate recommendations. It was anticipated that this report would be published and would influence the revision of the Analyst's Guide (HSG248).

3 METHODOLOGY

LETTER AND QUESTIONNAIRE

3.1 A questionnaire was sent to all organisations accredited for 4SCs listed on the UKAS website in December 2013. A letter accompanied the questionnaire. A copy of the letter and questionnaire are provided in Section 8, Appendix 1 of this report. The aim was to inform analysts of HSE's intention to inspect the industry and also gather some initial data to help target organisations for inspection.

Analyst organisations that completed and returned the questionnaire were selected for inspection using the following parameters:

- Geographical location
- Frequency of audit
- Equal to or greater than three 4SCs undertaken per day
- Fixed fee for undertaking 4SCs
- Laboratory engaged by licensed contractors
- Size of laboratory and number of analysts
- Number of 4SCs carried per year
- Anything else from the questionnaires that caused concern.

These organisations were known as **Responders**.

The organisations that did not reply to the initial request to complete and return the questionnaire were sent a reminder letter in February 2014. Those that did not respond to the reminder letter were known as **Non-Responders**.

There were also a number of organisations that replied stating that they no longer undertake 4SCs.

Each HSE Inspector was allocated five Responders and four Non-Responders. The Inspector was charged with inspecting three of the five Responders and one of the four Non-Responders. A total of four organisations were visited per Inspector.

HEAD OFFICE INSPECTIONS

3.2 Head office visits were completed first with 4SC inspections made later (arranged either during or after the head office visit). This ensured the 4SC inspection had the best chance of capturing all four stages of the 4SC, including the clearance test of the decontamination unit (DCU).

The head office inspection was used to obtain information and documentation about work practices, policies and procedures. An aide memoire (Part A-Head Office Inspection) was used to help guide questions during the inspection. A copy of the aide memoire is provided in Section 8, Appendix 2. The executive summary sheet at the front of the aide memoire was used to summarise key issues identified in the head office inspection for inclusion in this report.

Where necessary the following information was collected for further examination by HSE:

- Written procedures for entering enclosures and decontamination.

- The organisation's most recent UKAS audit report.
- Personal sampling and leak testing strategy.
- The organisation's most recent personal sampling air test certificates, for sampling carried out for clients (when the laboratory project manages asbestos works on the client's behalf) and/or licensed contractors.
- The organisation's most recent personal sampling air test certificates, for personal sampling carried out on their own analysts for health and safety reasons.
- Select one analyst and collect details of all work carried out in the last week. Obtain their most recent 4SC certificates for reoccupation.
- Identify and collect, where appropriate, a number of slides for re-examination by HSE's Health & Safety Laboratory.

4SC INSPECTIONS

3.3 The purpose of the 4SC inspection was to examine the actual work methods of an analyst carrying out a 4SC and compare their work with CAR 2012 and the Analysts Guide (HSG248). An aide memoire (Part B-4SC Inspection) was used by HSE Inspectors to help guide questions during the inspection. A copy of the aide memoire is presented in section 8, Appendix 2. The executive summary sheet at the front of the aide memoire was used to summarise key issues from the 4SC inspection for inclusion in this report.

4 RESULTS

4.1 RESULTS: QUESTIONNAIRES

The results of the questionnaires are displayed in graphical form and discussed in this section.

Question 1:” How many 4-stage clearances has your laboratory carried out in the year from 1 January 2013 to 31 December 2013?”

4.1.1 The results (Figure 1) show that the number of 4SCs conducted in 2013 by analyst organisations ranged from 2 per year to over 1000. Forty five (45) laboratories performed between 101-500 inspections while some 18 and 13 organisations conducted between 501-1000 and over 1000 visits respectively. Therefore some 31 organisations conducted over 66% of the total number of 4SCs (over 23000 clearances). Nineteen organisations performed fewer than 100 clearances with two analysts conducting less than 10.

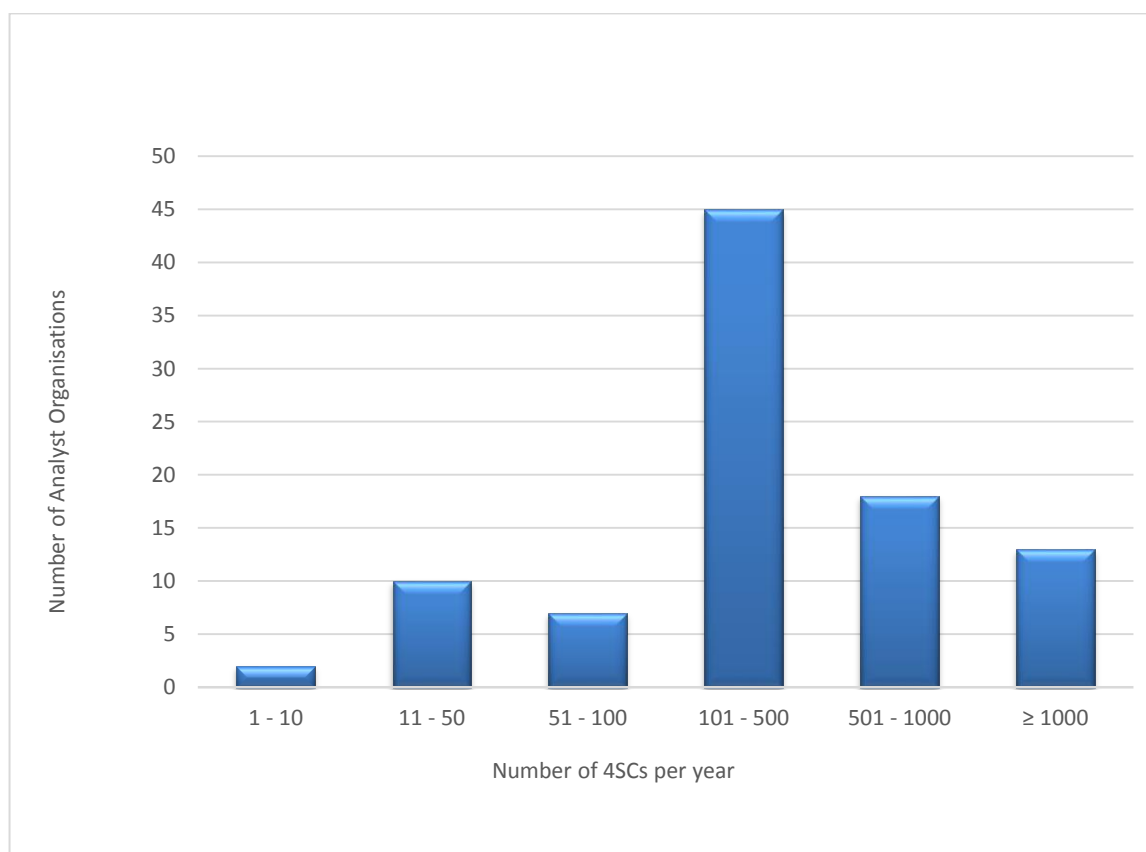


Figure 1: The number of 4SCs carried out by individual analyst organisations in 2013 (4 organisations did not answer this question).

Question 2: “How many people in your laboratory are involved in carrying out 4-stage clearances?”

4.1.2 The number of analysts carrying out 4SCs in the respective organisations is shown in Figure 2. Not surprisingly, the size of the analyst organisation reflects the number of 4SCs conducted. Thirteen organisations employ more than 50 individual analysts while some 18 and 45 organisations employ between 41-50 and 31-40 analysts respectively. Twelve organisations employ less than 20 analyst staff with two organisations employing less than 10 analyst personnel.

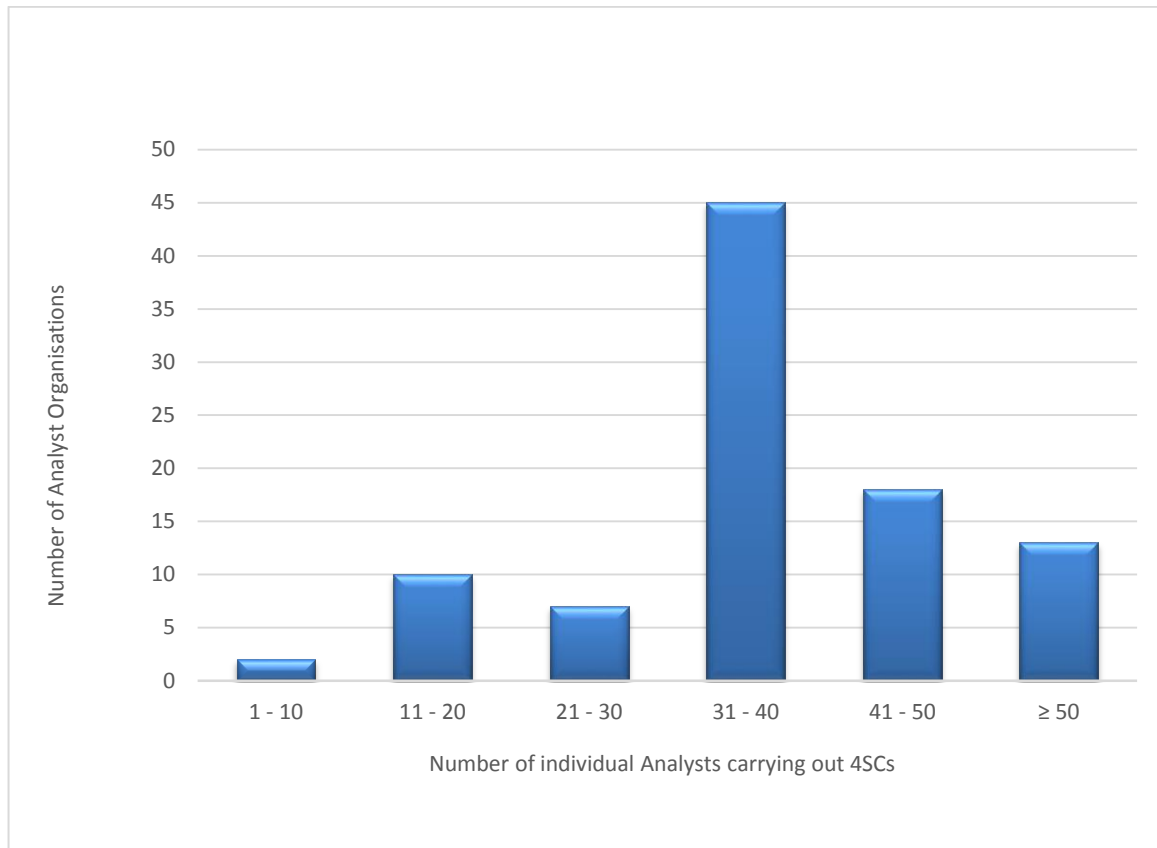


Figure 2: The number of individual analysts carrying out 4SCs in the organisations in 2013 (4 organisations did not answer this question).

Question 3: “On average, how many 4-stage clearances would an individual analyst normally carry out in a working day?”

4.1.3 The number of 4SCs reported to be carried out by individual analysts per day in displayed in Figure 3. The results indicate that most analysts (~68%) conducted one clearance per day while 32% conducted two clearances per day.

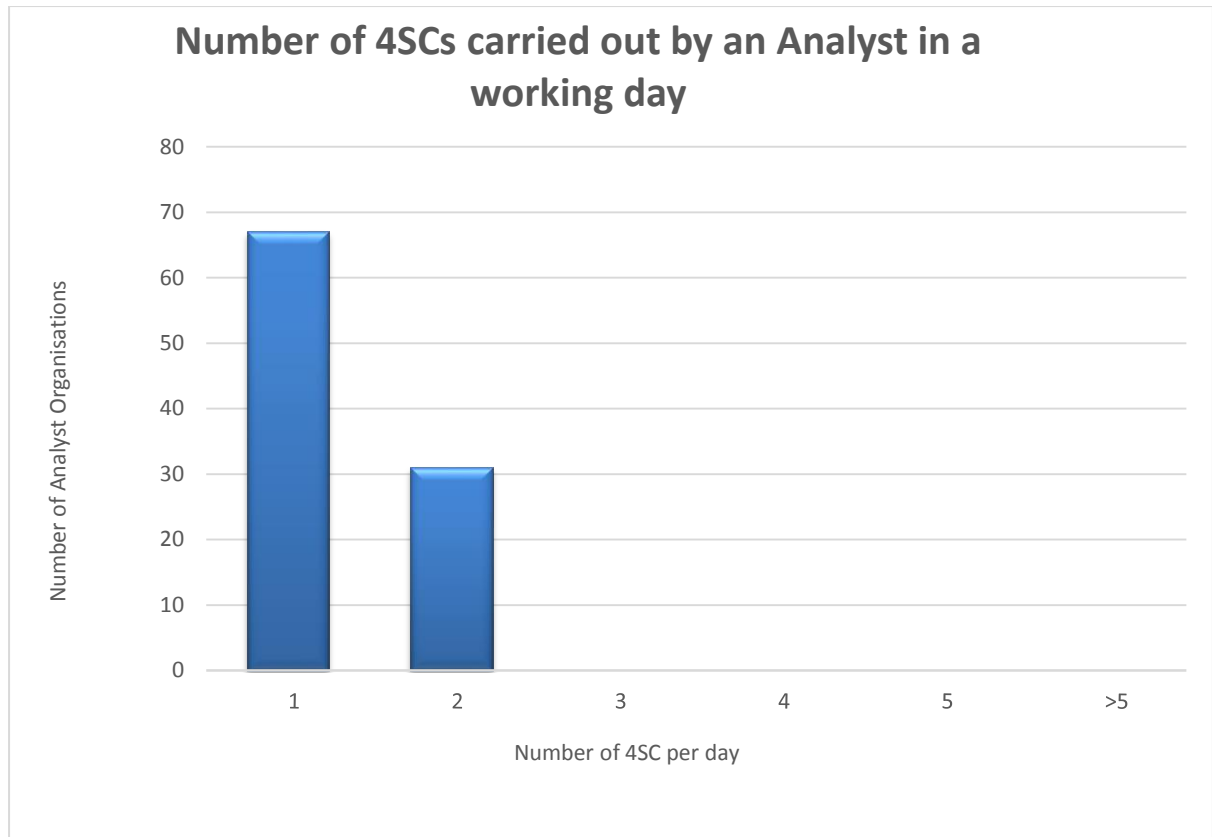


Figure 3: The number of 4SCs reported to be carried out by individual analysts per day (1 organisation did not answer this question).

Question 4: “On average, how often do individual analysts in your laboratory carry out 3 or more 4-stage clearances in a day?”

4.1.4 The number of days per year that analysts carry out three or more 4SCs is shown in Figure 4. The results reveal that there are occasions when three or more 4SCs will be carried out per day. Most analyst organisations (>80%) conduct multiple clearances on only a small number of days (<5days) per year but four analyst organisations conduct multiple clearances on more than 20 days per year.

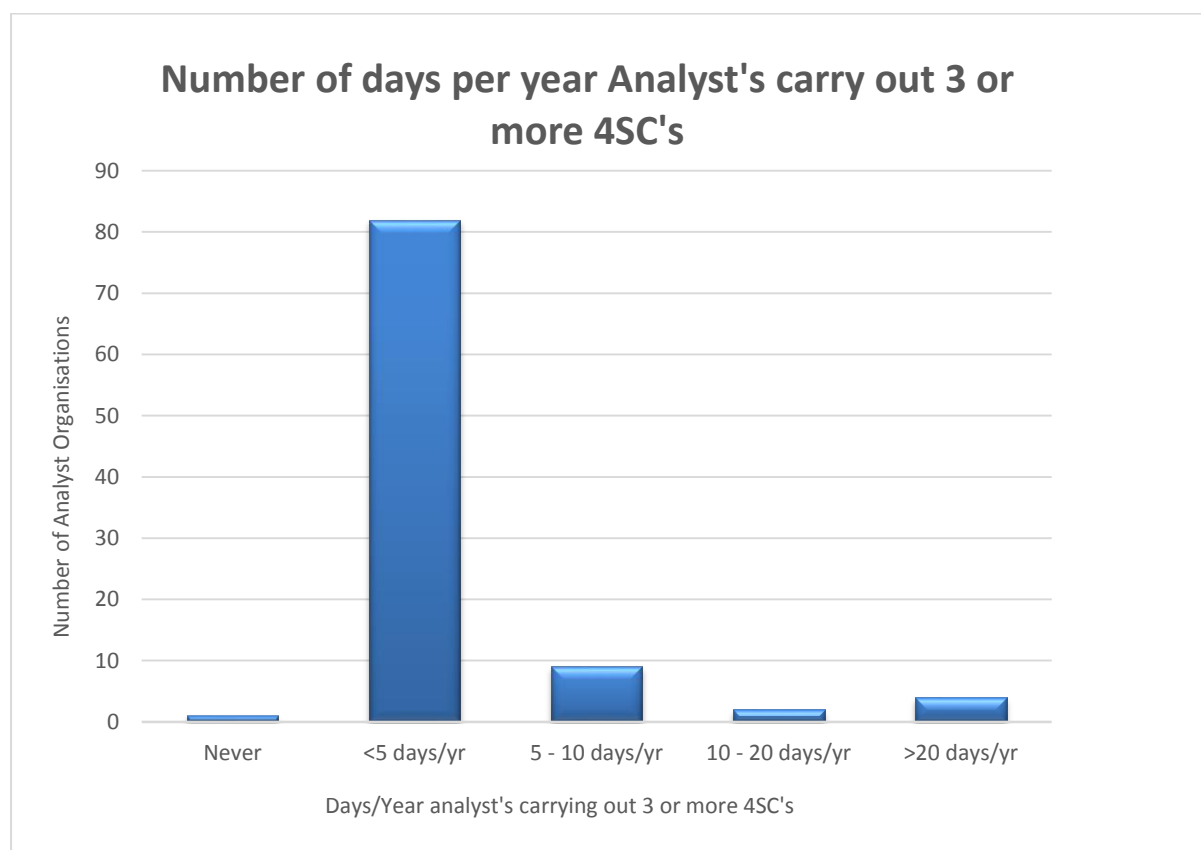


Figure 4: The number of days per year that analysts carry out three or more 4-stage clearances (4 organisations did not answer this question).

Question 5: “How often do you audit the site activities of your analysts involved in carrying out 4-stage clearances?”

4.1.5 Figure 5 displays the frequency analysts are audited performing 4SCs. All analysts are audited during each year. Most analysts (>60%) are audited annually. However, a small but significant proportion (~23%) are audited on a 6-monthly basis. Some analysts are audited more frequently: Five percent are audited every 3-months and 7% are audited on a monthly basis.

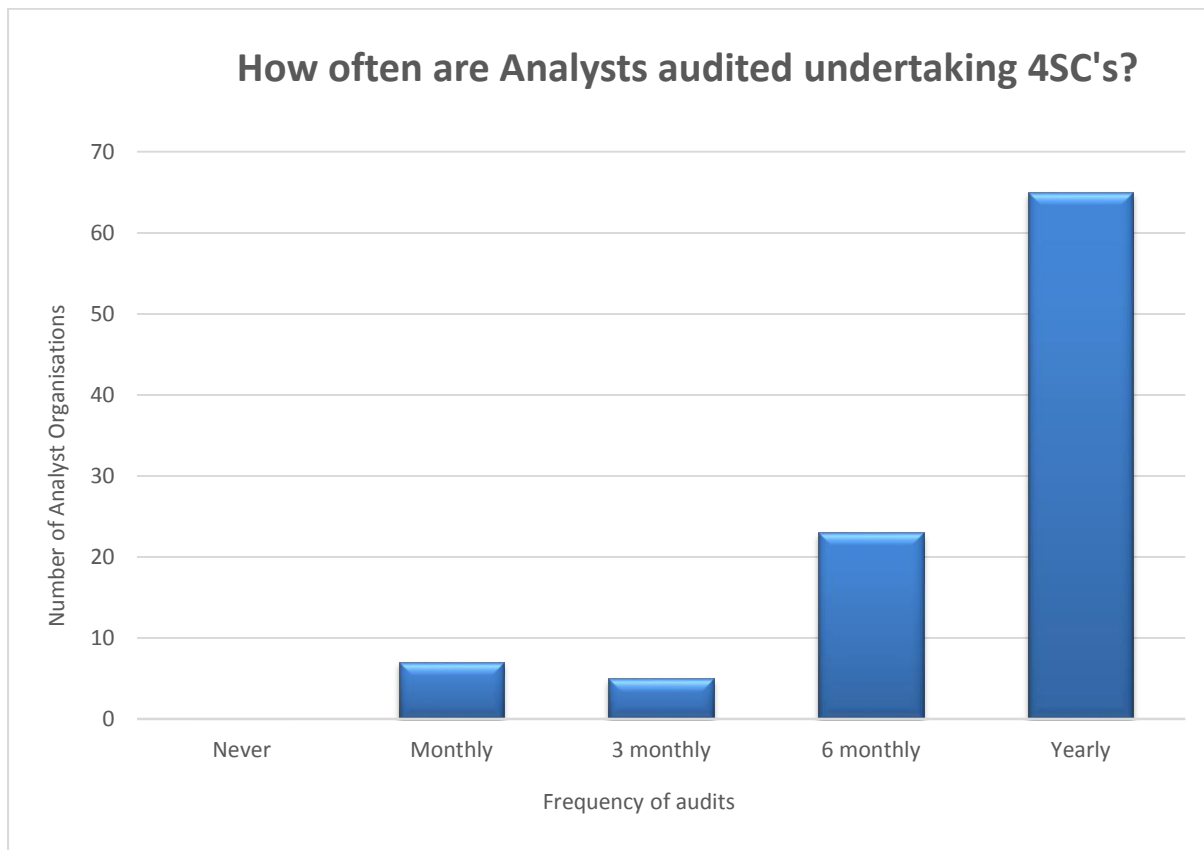


Figure 5: The frequency analysts are audited performing 4SCs.

Question 6(a) “In the year 1 January 2013 to 31 December 2013, approximately how many 4-stage clearances have been failed (i.e. a fail certificate issued)?”

4.1.6 Figure 6 shows the approximate number of times (ie percentage terms) analysts have formally failed a 4SC (ie issued a formal fail certificate). The evidence suggests that 4SCs are failed on a relatively infrequent basis. Most analysts (~75%) indicate that they fail jobs on between 1-20% of occasions. A small number (~2%) however identify that they fail jobs on most occasions (81-100%). In contrast, a larger but still relatively small group (~10%) indicate that they never fail any clearances.

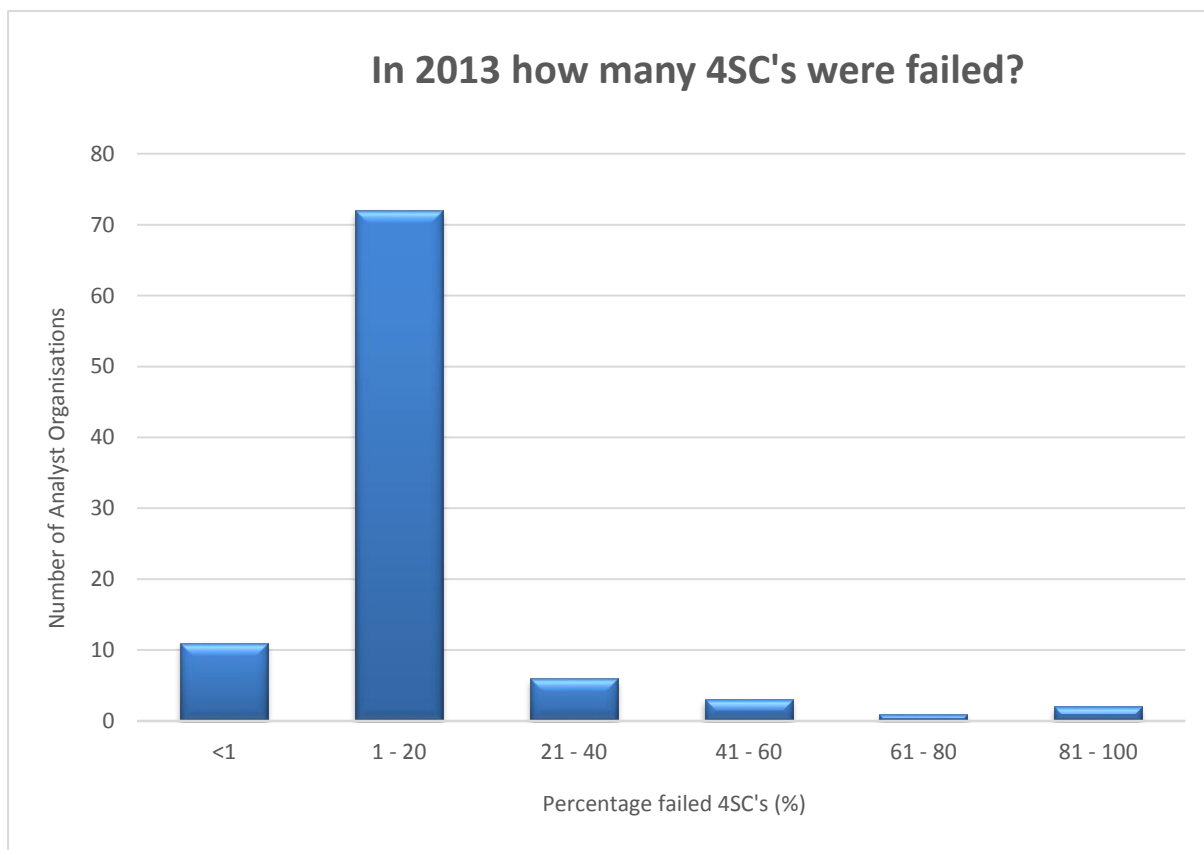


Figure 6: The approximate number of times (ie percentage terms) analysts have formally failed a 4SC (ie issued a formal fail certificate) (4 organisations did not answer this question).

Question 6(b): “In the year 1 January 2013 to 31 December 2013, approximately how many 4-stage clearances have required on-site action (eg additional cleaning) to obtain a pass?”

4.1.7 Figure 7 shows the approximate number of times (ie percentage terms) some additional cleaning has been necessary for a successful 4SC to be achieved. Most analysts (~85%) indicate that some additional cleaning is required to obtain clearance. Supplementary cleaning is not required in around 13% of clearances. A significant number of analysts (~43%) indicate that further cleaning is necessary in the vast majority of their clearance work (81-100%). This equates to some 12000 plus removal projects in 2013. A further 20% suggest that additional cleaning is needed in around half of their jobs.

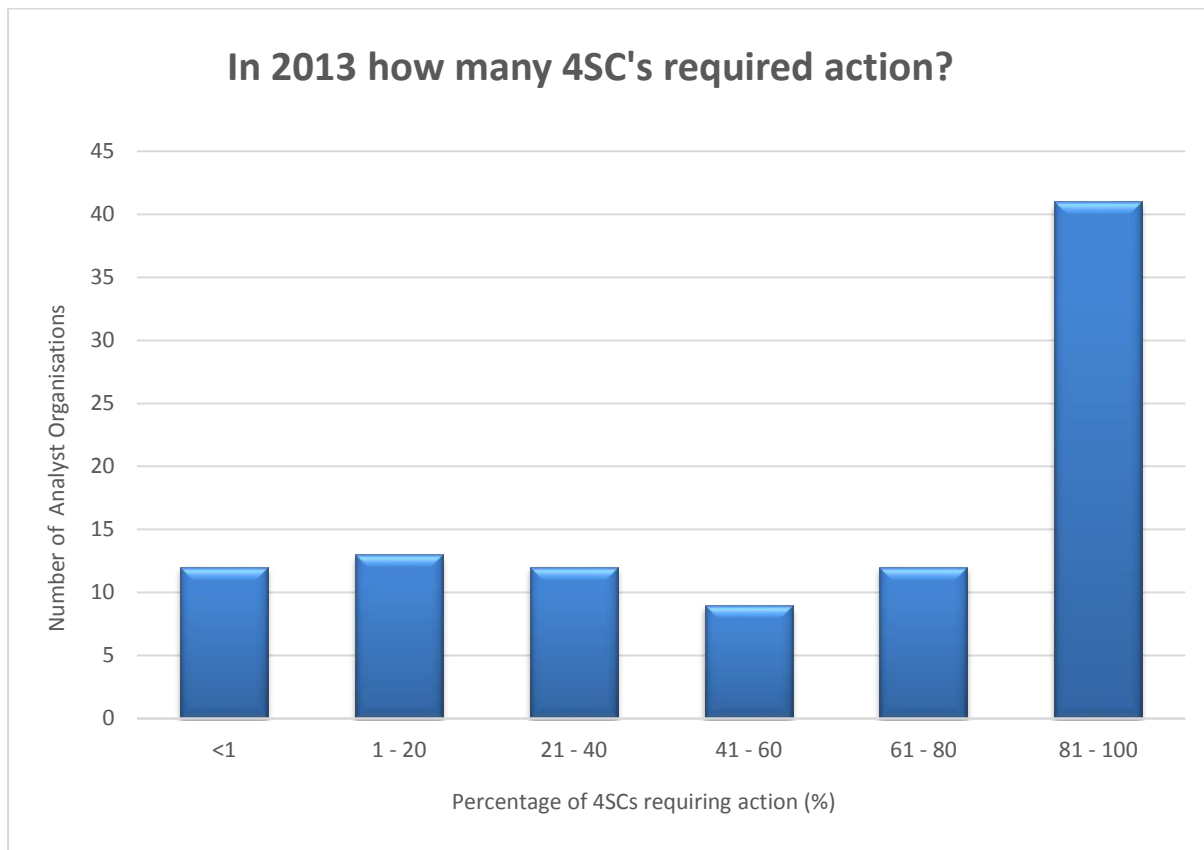


Figure 7: The approximate number of times (ie percentage terms) some additional cleaning has been necessary for a successful 4SC to be achieved (1 organisation did not answer this question).

Question 7: “Approximately how many clients have you carried out 4-stage clearances for within the year 1 January 2013 to 31 December 2013?”

4.1.8 Figure 8 summarises the approximate number of clients that analysts have worked for during the year 1 January 2013 to 31 December 2013. The data reveals that around 10% of analysts have been engaged by over 50 clients with around 5% working for more than 100 clients. This is likely to mostly reflect the substantial number of clearance jobs performed by the larger analyst organisations (over 500 removal projects). There will also be a number of regular or repeat clients. In contrast, around 30% of analyst organisations have worked for fewer than 10 clients.

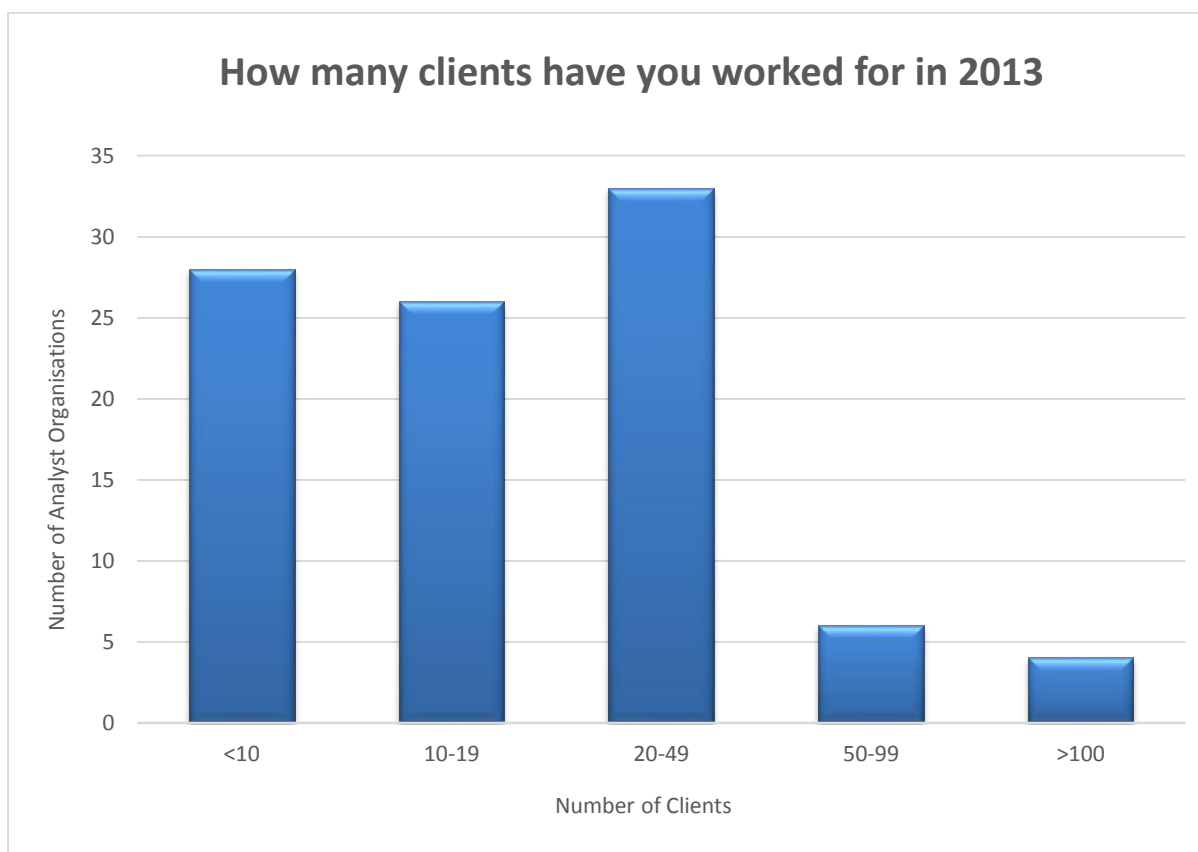


Figure 8: The approximate number of clients that analysts have worked for during the year 1 January 2013 to 31 December 2013 (4 organisations did not answer this question).

Question 8: For approximately what percentage of these 4-stage clearance jobs were you engaged directly by (a) the licensed contractor and (b) the client/property owner?

4.1.9 Figures 9(a) and 9(b) summarises the estimated percentage of jobs where the analysts have been engaged by the licensed contractor and the client/property owner respectively. The study sought to establish the source of the analyst's work and to what extent the analyst is engaged by the client/property owner or the licensed contractor.

The data indicates that there is a mixed picture regarding the analyst's employment. Figure 9(a) shows that around 25% of analysts are engaged by the licensed contractor in most jobs (81-100%) while around 40% are never or rarely (<20%) employed directly by the licensed contractor. Overall, the data suggests analysts are employed by the licensed contractor in less than half of all jobs.

The data presented in Figure 9(b) is generally consistent with the previous information. The client/property owner primarily engages (80-100% of occasions)) the analyst in around 40% of jobs. The data also suggests that the analyst is never or only rarely not employed by the client/property owner in around 15% of situations.

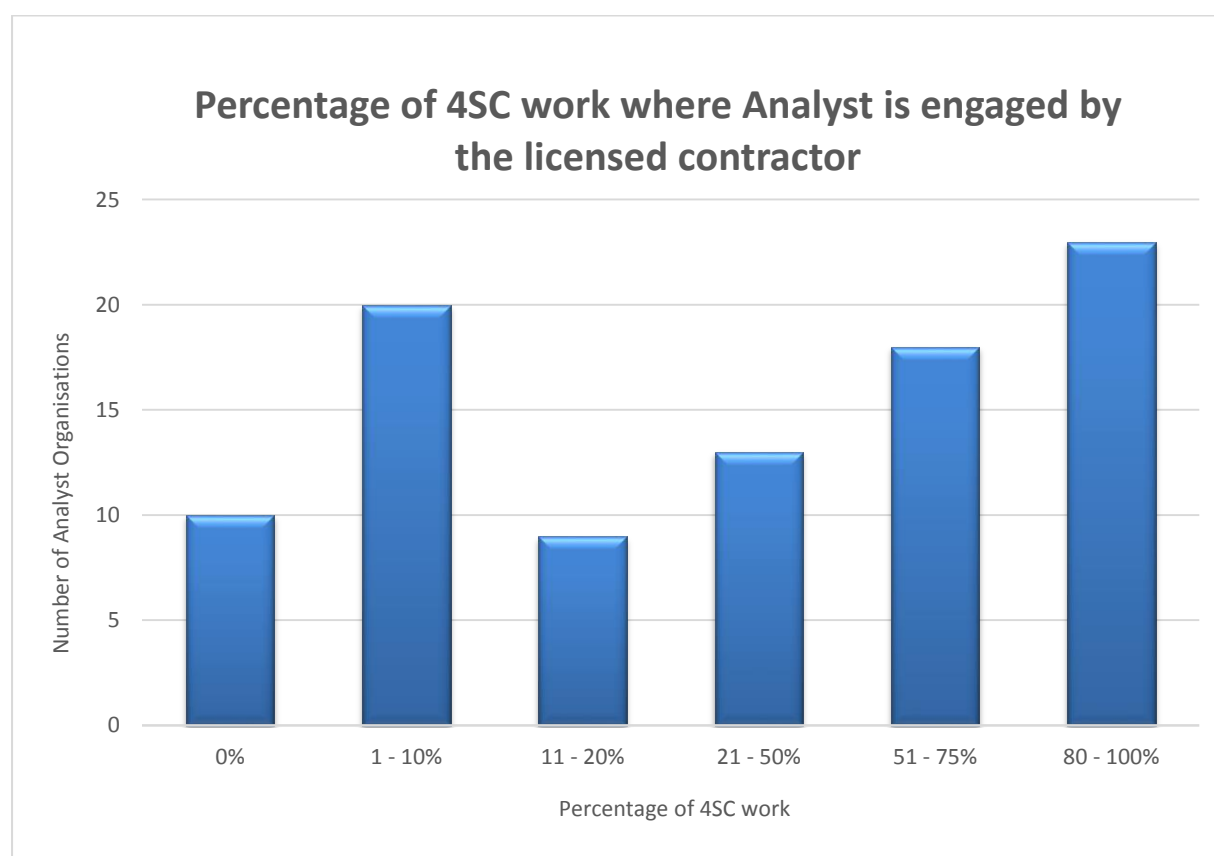


Figure 9(a): The estimated percentage of jobs where the analyst has been engaged by the licensed contractor (6 analysts did not answer question 9).

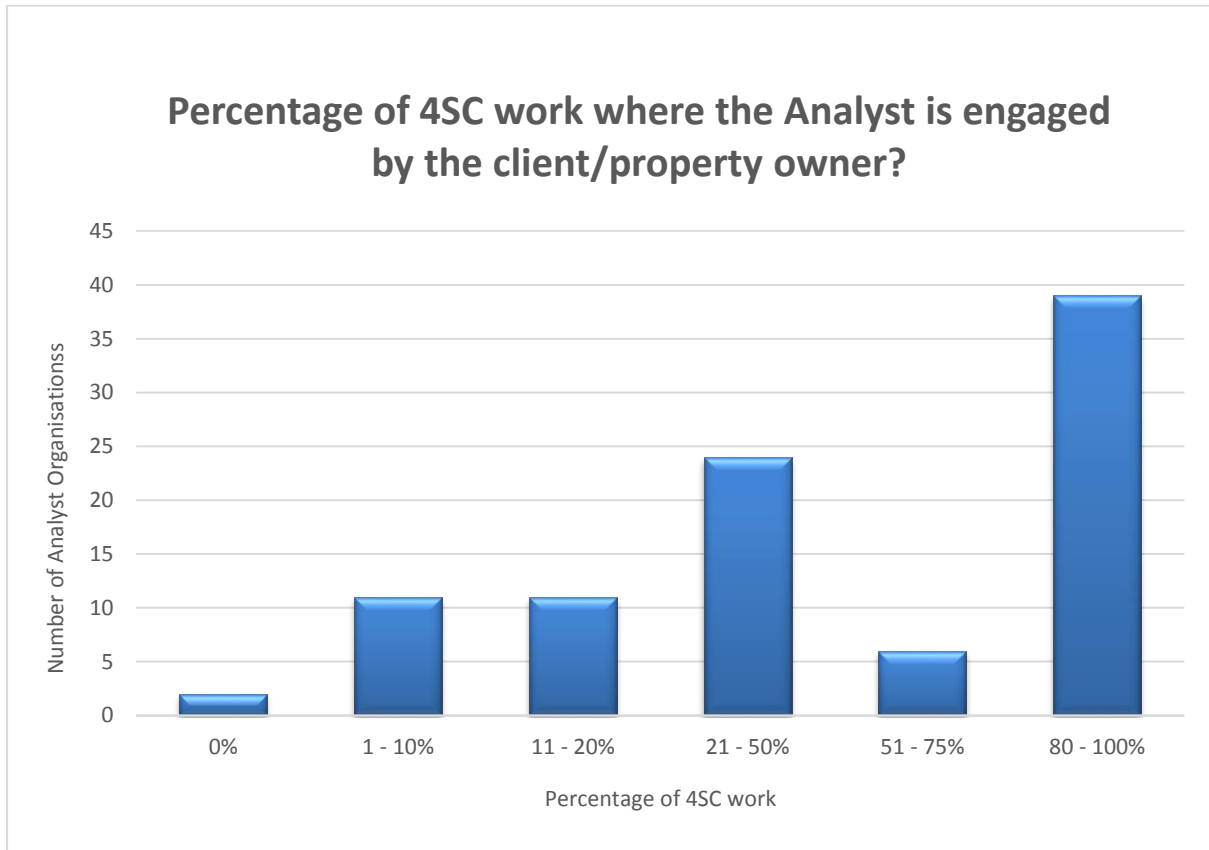


Figure 9(b): The estimated percentage of jobs where the analyst has been engaged directly by the client/property owner.

Question 10: Do you issue photographs as part of the 4-stage clearance?

4.1.0 Figure 10 shows the number of analyst organisations (some 24%) who in February 2014 were already including photographic evidence in the certificate for reoccupation.

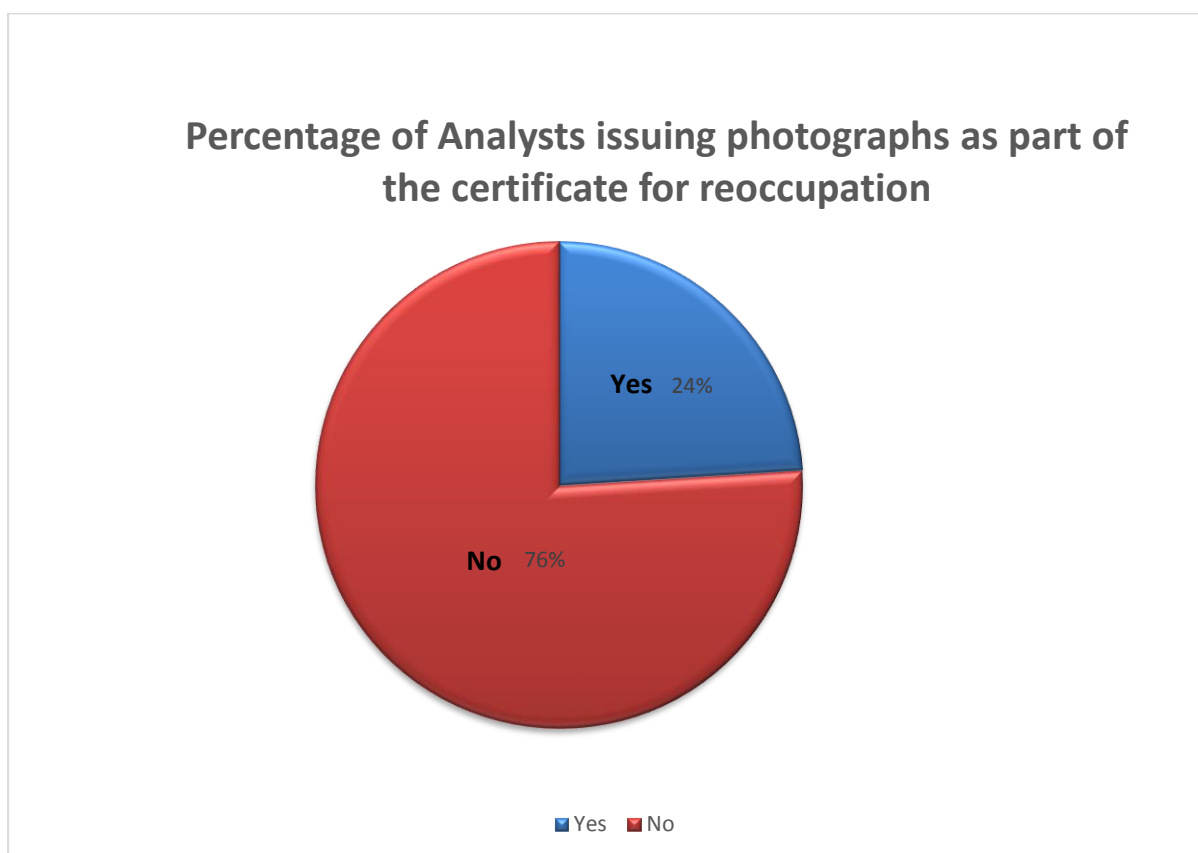


Figure 10: The number of analyst organisations currently including photographs in the certificate for reoccupation (4 organisations did not answer this question).

4.2 RESULTS: HEAD OFFICE AND 4-STAGE CLEARANCE INSPECTIONS

The results of the head office visits and 4SC inspections are presented in this section.

4.2.1 Decontamination:

- (i) Decontamination procedures at three organisations permitted the use of domestic clothing underneath coveralls whilst carrying out 4SC's.
- (ii) One organisation's written procedures on decontamination did not have enough detail to comply with the Analysts' Guide (HSG248).
- (iii) Some organisations did not provide practical training for their analysts on decontamination procedures.
- (iv) Four analysts wore domestic clothing underneath their coveralls whilst undertaking 4SC's.
- (v) Some analysts showered during the 4SC procedure, when preliminary decontamination in the enclosure/air lock would have been sufficient.
- (vi) One analyst arrived on site to undertake a 4SC unshaven and had to have a shave in the DCU prior to commencing the 4SC.
- (vii) Another analyst carried out the 4SC while unshaven. The analyst was observed at stage 4. The analyst admitted carrying out stages 1 to 3 of the 4SC procedure unshaven. The same analyst had no coveralls on site and also stated that he had undertaken the 4SC in his underwear.
- (viii) One analyst did not fully undertake preliminary decontamination on exiting an enclosure through the airlock system.
- (ix) Another analyst did not bring enough coveralls to site for the 4SC. He had to use coveralls provided by the licensed contractor.

4.2.2 Stage 1 of 4SC

- (i) One analyst had not taken account of builders' equipment and rubble/debris along the transit route and the type of surface (e.g. grass) potentially missing asbestos debris.
- (ii) Another analyst had not checked the DCU to ensure the water supply was connected and the DCU was operational and ready for use.

4.2.3 Stage 2 of 4SC

- (i) One analyst did not undertake a progressive inspection inside an enclosure at stage 2. The analyst did not inspect the airlock system on entering the enclosure and went straight to the far end of the enclosure to begin the visual inspection.
- (ii) One analyst was observed vacuuming an enclosure at stage 2 for approximately an hour and ten minutes on his own without a representative of the licensed contractor.
- (iii) One analyst had not been issued with a mirror by his employer for undertaking 4SCs.

(iv) One analyst carried out a visual inspection inside an enclosure almost immediately after the completion of removal by the licensed contractor and the visual inspection at stage 2 lasted only 6 minutes. Subsequently the air sampling slides for the air test at stage 3 were occluded and could not be counted. The air test had to be repeated after the enclosure had been purged.

4.2.4 Stage 3 of 4SC

(i) It was routine with some laboratories to carry out the clearance air test on the DCU whilst undertaking stage 3.

(ii) One analyst was observed counting slides too quickly at stage 3, potentially missing countable fibres.

(iii) Some other certificates for reoccupation analysed by HSE showed fibre counting was undertaken too quickly, when taking into account the timings on certificates and the time for preliminary decontamination and transiting procedures.

(iv) One analyst had forgotten to bring along a brush to use in active disturbance and used a cloth instead.

(v) One analyst was observed remaining inside the enclosure for the whole period the sampling pumps were sampling for airborne fibres in the air (approximately 30 minutes).

4.2.5 Stage 4 of 4SC

(i) One analyst was observed not taking a precautionary approach to visually inspecting the area at stage 4. The analyst did not have to hand coveralls and RPE in case these were required for undertaking the visual inspection.

4.2.6 Certificates for Reoccupation

For each laboratory head office inspection a number of certificates for reoccupation were collected for further analysis by HSE. A summary of the examination of those certificates is listed below.

(i) The completion time of each stage was recorded but there was no record of the duration of each stage. In some cases the duration was very short and suggested limited thoroughness.

(ii) The time taken for Stage 1 was brief relative to the length and complexity of the transit route, indicating the inspection was limited.

(iii) One certificate had no record of the time taken to complete stages 1 and 2.

(iv) One head office inspection identified that there was no information on the amount of asbestos removed (area or dimensions) in any of the 4SC certificates. In addition, most certificates failed to include details of the type of asbestos involved (eg chrysotile, amosite).

(v) Information on enclosure dimensions was mixed. Some certificates provided the information but others failed to include full enclosure dimensions or were not comprehensive

enough. Where an enclosure was of an irregular shape eg L-shaped or cruciform, the dimensions details were incomplete.

(vi) In some multiple room enclosures air samples were only collected from some of the rooms. Not all rooms were assessed.

(vii) One analyst requested the contractor remove asbestos residues during the stage 2 visual inspection. This action was not recorded on the certificate for reoccupation.

(viii) There was difficulty interpreting some hand written certificates due to poor hand writing.

(ix) In some reports there were simple errors in the recording of data eg a clearance stage ending at a time earlier than the start ie 22.05hrs instead of 23.05hrs.

(x) The duration of stage 3 for at least three 4SCs was very short indicating slides had not been assiduously counted. Preparing and counting three slides was completed in less than 9 minutes.

(xi) One airlock was noted as located fully within the enclosure. There was no reference regarding implication for air sampling numbers.

(xii) There was a lack of contextual information on the certificates for reoccupation for stage 1. There was little description of the transit route conditions eg clear, materials or equipment present, extent of grass/soil etc, and how the analyst had dealt with a situation to confirm no asbestos debris was present.

4.2.7 Personal Sampling Results Certificates

(i) Personal monitoring had been undertaken by one laboratory but there was no comparison with any exposure limit eg the Control Limit.

(ii) There was a lack of contextual information on personal sampling certificates including:

- Employer/role of individual not defined (but some could be deduced from the description of task).
- The descriptions of the work undertaken were too brief to understand what the worker was doing.
- The type of ACM removed/worked was not always identified.

(iii) Photographs included with certificates helped put the information into context.

(iv) One personal sample for a licensed contractor indicated that the exposure was less than the limit of quantification (LOQ): the calculated exposure was 0.179 f/ml and reported result <0.2 f/ml. The Analysts Guide recommends result should be reported as 0.18 f/ml (2 decimal places).

(v) One personal sample was reported as 0.01 f/ml and another as <0.048 f/ml. Based on the LOQ they probably should have been reported as <0.6 f/ml.

4.2.8 Leak Testing Certificates

- (i) Leak testing was carried out by a number of analysts. Results were typically compared with the clearance indicator value of 0.01f/ml.
- (ii) All leak results examined were less than the clearance indicator of 0.01f/ml.
- (iii) Contextual information was noted to be good, with the position of the samplers indicated on site plans.

5 COMMENTS ON FINDINGS

5.1 The Analysts' Clients

(i) A number of analysts indicated that all of their work was carried out directly for the client/property owner. However, the majority of organisations reported that less than 50% of their work was directly for the client/property owner. A proportion of analysts felt that standards would be significantly improved if it was legal requirement that the analyst was employed by the property owner/occupier rather than the removal contractor.

(ii) Several analysts stated that increasingly their business strategy was to provide a project management service to their clients and not simply a basic visit. Many felt that this type of service and support improved standards through the duration of the project.

(iii) Several organisations suggested that analysts should only be appointed directly by the owner or occupier of the premises and some also considered that this should be a mandatory requirement. A number of organisations considered it inappropriate for the analyst to be employed directly by the licensed contractor.

(iv) A number of analysts expressed the view that they were at a commercial disadvantage because they do a "proper job". The licensed contractor considered them too fussy or would take too long to carry out the visual inspection at stage 2. Some analysts were considered "to be over the top" when carrying out 4SCs. One laboratory commented that they were only considered when the licensed contractor knew, for example, that the enforcement authorities were interested in the work being carried out.

(v) A number of organisations advocated that the client should book the analyst for a half or full day to ensure adequate time to carry out the 4SC procedure. It was suggested that longer booking periods this would help reduce the time pressures analysts face from licensed contractors.

(vi) Several analysts felt that consultant input at the scoping stage of the work and avoiding licensed contractors' pricing their work would be beneficial, and would ensure that the desired outcome is achieved. Deviations from the original scope would only proceed by agreement.

(vii) A number of analysts confirmed that they used photographs to illustrate where enclosures had failed. Also, where formal failure at stage 2 occurred, additional costs for further cleaning would be borne by the licensed contractor.

(viii) Several analysts recognised that licensed contractors have stiff competition for works which they believed was leading to lower price bids with the consequence that there was commercial pressure to complete jobs more quickly. They believed that the pressure was impacting on removal and cleaning standards such that a high percentage of clearances required additional cleaning prior to air testing.

(ix) A number of analysts reported that remedial work was often required but that it was not always documented as a fail.

5.2 Pricing of 4 stage Clearances

(i) Analyst organisations operated a variety of pricing strategies ranging from basic daily rates to quoting on a case by case basis taking into account a number of factors based on their understanding of the nature of the work. These factors included: type and quantity of

asbestos removed, number of air tests required, complexity of the task and distance from the office.

(ii) The sector appears to be very competitive on prices with a number of analysts reporting 4SC prices as low as £110. However, the majority of analysts stated that they were not prepared to lower standards to reduce prices. Many felt that lowering prices would have a negative effect on the amount time given to analysts to complete the 4SC properly.

(iii) A number of analysts stated that there is normally a fee for the day irrespective of job. There is an extra charge if the clearance extends to a second day. However, some analysts have a minimum charge of half a day regardless of the size of the job.

(iv) Where the client employs the analyst and there is a clearance failure resulting in extra time on site, then the extra cost is claimed. It is suggested to the client that the licensed contractor is liable for these extra costs as their work has been sub-standard.

(v) One analyst organisation reported that the cost is dictated by the complexity of the work and they would be involved in the scoping and pricing of the job. A number of analysts also stated that they assisted the client to scope the removal work including with the pricing of the job and the tendering process.

(vi) One analyst organisation commented that a low price equated to a low standard.

(vii) A small number of analysts stated that, in their view, cleaning standards had improved, for example they had recorded a general reduction in fibre counts as part of stage 3 since the introduction of the requirement to brush enclosures for the disturbed air sampling.

(viii) One analyst organisation suggested that prices for 4SC testing should be raised across the board to achieve improved results. Another analyst stated that HSE does not have a good understanding of what actually happens on site.

5.3 Number of 4-stage clearances conducted per day

(i) The majority of analyst organisations who took part in the study stated that their aim was to carry out only one 4SC per day. The maximum reported carried out per day was three.

(ii) A number of analysts suggested that the number of 4SCs could be more than one per day in some circumstances eg if the job is small (eg a small enclosure and the scope of the work limited such as removal of a single AIB panel). A large majority of analysts reported that more than three 4SCs per day was rare over the last 12-month period. It could occur where a number of small jobs were being undertaken in the same location or the work was part of a large on-going project eg a housing block and the work was simple in nature i.e. removal of single insulation panel.

(iii) A number of analysts expressed the view that it was vital to engage with the licensed contractor at an early stage and “to talk through the work” prior to the analyst arriving on site.

(iv) A number of analysts stated that licensed contractors considered that they took too long to complete stage 2. A small number of analysts felt that organisations carrying out 4 or 5 clearances per day would either not respond to the questionnaire or not answer truthfully. In addition, it was felt that the licensed contractors carrying this number of removals per day should be placed under greater scrutiny.

(v) Some analysts stated that there was insufficient time to complete the 4SC. Times for completion of 4SC should be clamped down on across the industry. Licensed contractors should be forced to respect the analysts more and allow them the time needed to do the visuals thoroughly. There should be a maximum of two 4SC jobs done in one day.

(vi) It is very rare that the site supervisor carries out an inspection prior to the analyst arriving on site to carry out a 4SC. The biggest improvement within the industry would be to prohibit removal contractors employing the analytical firm directly. There should be legislation to limit the number of clearance tests that any one individual can carry out in any 24 hour period to two clearances.

(vii) A number of analysts stated that the industry would be best served by moving forward into the 21st century with the analysts being independently appointed directly by the client, never by the contractor, ensuring independence and impartiality. This is the system in the Channel Islands where it is a requirement of the ACOP in both Guernsey and Jersey. It is felt that this is much better.

(viii) There is a huge onus on licensed contractors to be the cheapest and that cost is the main issue when tendering for work – this comes from the client – especially councils and housing associations. Also ridiculous situations for removal work are being forced onto contractors eg electrics and gas to remain live in enclosures, working with tenants remaining in houses and not allowing heating/boilers/plant to be switched off.

5.4 Wearing domestic clothing under coveralls

(i) A number of analysts expressed concern over what they considered to be a change in legislation regarding the wearing of domestic clothing underneath coveralls when carrying out 4SCs.

(ii) Analysts commented that the procedure they had adopted was compliant with current legislation and had been visible to UKAS through a number of audit cycles. They were unaware that the “rules” had changed.

(iii) A number of the analysts who took part in the study reported that analysts routinely wore domestic clothing under coveralls when carrying out 4SCs.

(iv) A number of organisations stated that they supplied work wear to their staff. In one case the employer supplied two sets of clothing so that if the analyst became contaminated they could change into clean uncontaminated clothing.

(v) Some of organisations reported that they would review their procedures regarding the wearing of domestic clothing underneath the coveralls and the need to undergo full decontamination.

5.5 Additional Cleaning by Analysts

- (i) One analyst organisation reported that all enclosures require some level of remediation work/cleaning as part of the visual inspection and that the fine cleaning carried out by contractors is generally poor and has not noticeably improved in the last 20 years.
- (ii) A number of analysts expressed the view that general clearance standards across the industry were very poor. This was not necessarily the fault of individuals analysts but was due to poor scoping of the project and unrealistic expectations of what can be achieved.
- (iii) A number of analysts commented that only a small percentage of supervisors properly check the enclosure prior to the analyst entering. A significant number of analysts commented that licensed contractors are always “rushing” resulting in unnecessary pressure on the analyst.
- (iv) In most cases, the analysts indicated that additional work was required for the 4SC to pass. Cleaning was the most common reason for failures. However in many situations analysts did not formally fail the job or issue a failure certificate preferring instead to point out the reason for the failure to the licensed contractor and to allow further cleaning to take place. Many analysts reported that they carry out minor cleaning themselves rather than issuing a fail certificate.
- (v) An analyst was observed cleaning an enclosure using a vacuum cleaner as they progressed through their visual inspection for a period of one hour and ten minutes. The analyst should have requested a representative of the licensed contractor to be present inside the enclosure whilst they carried out the visual inspection. The cleaning should have been undertaken by the licensed contractor and the enclosure failed if necessary for further cleaning and purging with clean air. The action of the analyst put himself at risk of being exposed to asbestos.

5.6 Additional comments

- (i) A number of laboratories commented that the role of the analyst was not fully recognised and the profile of the role needs to be raised. Where new removal contractors were involved, a number of analysts commented that the standard of cleaning was often poor. Several analysts stated that they would welcome unannounced visits from HSE for the 4SC.
- (ii) A number of organisations expressed the view that it should be mandatory for the analyst to be employed by the property owner or occupier.
- (iii) Only a small number of analysts reported that all relevant documentation was available prior to attending site.
- (iv) One analyst advocated a more comprehensive approach to the removal and subsequent testing prior to reoccupation. For example, the work area should be independently checked before removal works start. The enclosure should be independently checked for integrity and adequate airflow before removal takes place. There should also be closer monitoring as the work progresses including checks on airflow, personal exposure and methods of work.
- (v) One organisation explained that the majority of their work was asbestos surveys. The analyst commented that the price for carrying out air tests had fallen, hence the move to concentrate on surveying.

(vi) Concern was expressed that there was an increasing use of sub-contractors who are not properly trained or supervised. In one case the analyst had drawn up a list of sub-contractors who were not to be used. The analyst stated that there were increased problems with contractors who couldn't speak English, and the volume of work meant that contractors were using unskilled and untrained operatives. The analyst also stated that on an increasing basis more stage 2s were being carried out by operatives as opposed to supervisors as there was a shortage of trained and experienced supervisors.

(vii) A number of analysts mentioned the pressure to clear jobs particularly from licenced contractors. Some also thought that the pressure had got worse as a result of the recession. A number of analysts operated an electronic diary system to try and reduce some of the time pressure on analysts. A number of organisations acknowledged that when jobs go wrong or were delayed pressure increased on analysts to pass the job regardless. Analysts needed to be robust in their response.

(viii) One organisation highlighted problems with personal sampling for licenced contractors requesting sampling after the completion of removal works. Analysts are largely home based and the laboratory email the analysts the job details for the following day(s). No personal details are included in the email.

(ix) A number of organisations commented that analysts do not do certain jobs until they have shadowed an experience colleague on that particular type of work. For example, when carrying out 4SCs on certain types of asbestos eg AIB

(x) A number of analysts stated that half masks are normally worn for 4SCs. However for local authority or large jobs analysts would use powered full face respirators.

5.7 Site Visit Issues

5.7.1 Decontamination

(i) Some analysts went through the DCU including taking a shower. In the opinion of the inspectors, this was not necessary as the analysts were not visibly contaminated. It suggested a lack of understanding/appreciation of the need and circumstances to go through the full decontamination process.

(ii) Two analysts were unshaven. All analysts undertaking 4SC should be clean shaven when undertaking 4SCs. Section 8.20 of HSG248 requires employees wearing tight-fitting RPE to be clean shaven.

(iii) One analyst did not undertake preliminary decontamination on exiting an enclosure.

(iv) Two analysts turned up to undertake 4SCs with no coveralls. Analysts should ensure that they have enough coveralls to undertake 4SCs.

5.7.2 Stage 1 of 4SC

(i) Two analysts failed to undertake a satisfactory preliminary check of site condition and job completeness. Builder's equipment and rubble along a transit route was not dealt with.

5.7.3 Stage 2 of 4SC

(i) Some basic mistakes and poor practices were observed during stage 2.

- (a) Analysts did not undertake a progressive and systematic visual inspection of the enclosure. The inspection did not start at the airlock system but at the far end of the enclosure. Some analysts inspected on a random manner.
- (b) One analyst was not issued with a mirror by his employer. This is essential equipment for inspecting difficult-to see areas in the enclosure.
- (c) One analyst rushed too quickly to visually inspect an enclosure after removal had just been completed. This led to a situation where the enclosure had not had enough time to purge the contaminated air and the air test at stage 3 failed on the first attempt. In addition, the analyst also carried out the visual inspection too quickly and this may also have contributed to the air tests failing (i.e. the analyst may have missed dust/debris within the enclosure).

5.7.4 Stage 3 of 4SC

- (i) Some laboratories routinely carried out the clearance air test on the DCU whilst undertaking stage 3.
- (ii) Some analysts counted slides too quickly. HSG248, section A1.41 provides guidance on the typical time counters may take to evaluate a sample with a sparse dust deposit (typically 10-25 minutes).
- (iii) One analyst had forgotten to bring a brush to carry out a 4SC. Brushing or sweeping represents a realistic simulation of a possible future activity that may produce high airborne dust and fibre concentrations. The analyst used a cloth which would not give a realistic simulation.
- (iv) One analyst remained inside the enclosure for the whole air sampling period (approximately 30 minutes). This would potentially expose the analyst unnecessarily to asbestos fibres in the air. Companies should have a clear policy on enclosure entry and occupation.

5.7.5 Stage 4 of 4SC

- (i) It was noted that there may have been potential for spread of asbestos during stage 4 due to the structure/location of the enclosure and indicators of poor practice by the licensed contractor. Analysts need to be alert to such situations. An analyst should use a precautionary approach when visually inspecting an area at stage 4. In some instances RPE/PPE should be worn as a precaution.

5.7.6 Domestic Clothing and Decontamination

- (i) The use of domestic clothing underneath coveralls was written into some organisation's procedures and four analysts were also observed carrying out 4SC wearing domestic clothing underneath their coveralls. Section 8.33 of the Analysts' Guide states that "analysts should not wear domestic clothing under coveralls when undertaking 4SC". Analysts should change their procedures to ensure they are compliant with section 8.33.
- (ii) The lack of detail in one organisation's decontamination procedure was suggested as deliberate as the company preferred a practical approach to informing analysts on decontamination. The organisation involved knew the correct procedure in practice but had not written it into their procedures.

- (iii) Some organisation's decontamination training did not provide practical training for 4SC work. Such training helps puts theory into practice.
- (iv) The analysts going through the DCU and taking a shower during their 4SC, in the opinion of the inspectors, did not need to as they were not contaminated. Preliminary decontamination as described in HSG248 sections 9.4 and 9.5 would have been sufficient. This demonstrates a lack of understanding of either decontamination or the risk of exposure from asbestos fibres.
- (v) One analyst did not undertake preliminary decontamination on exiting an enclosure.

5.7.7 Certificate for Reoccupation

- (i) The main finding from analysing the certificates for reoccupation was the general lack of supporting/contextual information regarding the actions taken by analysts to resolve situations that required remediation. It is vitally important to capture such information to ensure the client/building owner is made fully aware of what work has been undertaken and how any problems have been rectified.
- (ii) The provision of photographs by some analysts greatly enhanced the information written on the certificates.
- (iii) Incorrect timings on certificates for reoccupation prevent a clear picture on 4SC progress and may hide shortcomings.
- (iv) Simple mistakes in calculating and reporting the clearance indicator may also lead to confusion and mislead the client/building owner. Poor hand writing didn't help the reader understand what work had been carried out during the 4SC process.

5.7.8 Personal Air Samples

- (i) A number of companies who took part in the project submitted personal sampling data for licensed contractors. In many cases the sampling time was the minimum required to comply with CAR and the ACOP i.e. 10 minutes.
- (ii) Contextual information was often lacking with only basic details of the work carried out. Typically the comment "removal works" was the only reference to the work being carried out.
- (iii) A number of companies commented that licensed contractors were only prepared to pay for the 10-minute test and were only having the test carried out to comply with the requirement in the ACOP.
- (iv) Where contextual information was recorded often important details were absent eg the employers name or the first name of the worker. A significant number of reports presented basic information only. Typically the type and quantity of asbestos present were not recorded in the report (An individual analyst may have more detailed records in personal logs and work diaries).
- (v) In many cases the quoted fibre concentration was less than the limit of detection based on the sample volume. One company stated that the minimum time they would sample for was 20 minutes regardless of the licensed contractor's objections.

(vi) It is important that sufficient contextual information is included with the sampling results to aid the licensed contractor in interpreting the measured airborne fibre concentrations.

5.7.9 Leak testing/Background testing/Reassurance testing

(i) Background and or re-assurance testing results were largely based on sampling times around 30 - 60 minutes. Sampling locations were typically shown on a site plan. Contextual information was in some cases more detailed than for personal sampling.

(ii) The reported results from all companies, for background testing and re-assurance testing was typically less than the clearance indicator of <0.01f/ml.

5.7.10 Personal sampling for the Analyst

(i) In most cases the contextual information supporting personal sampling was good with a clear description of the work being carried out, and a description of the enclosure etc. However, in a few instances, there was a lack of detail. More information may be held in other company records.

(ii) Sampling times appeared more representative of actual exposure times during 4 stage clearances.

(iii) In all cases where data had been submitted or collected the fibre concentrations recorded were below 0.01f/ml.

6 MAIN FINDINGS AND DISCUSSION

Factual

6.1 At the time of this exercise there were around 30 large analyst organisations employing over 40 individual analysts. Forty five organisations employed between 30 and 40 analysts. Some 31 and 13 organisations carried out more than 500 and 1000 4SCs respectively per annum (2013 data) accounting for some 66% of all 4SCs (equivalent to around 23000 clearances in 2013). In contrast, some 19 organisations performed less than 100 4SCs including two analysts who conducted fewer than 10 clearances.

6.2 The evidence suggests that 4SCs are failed on a relatively infrequent basis. Most analysts (~75%) indicated that they fail jobs between 1-20% of occasions. Around 10% of analysts indicated that they never fail clearances. Two percent stated that they fail jobs on most occasions (>81%).

6.3 The data indicates that there is a mixed picture as to who employs the Analyst. In most cases, Analyst work comes from a combination of clients and licensed contractors albeit in varying proportions. On balance however, the data suggests clients may engage the analyst on more occasions than the licensed contractor. Around 42% of analysts are engaged by the client in most jobs (81-100%) while only around 25% of analysts are engaged by the licensed contractor in most jobs (81-100%). Overall, the data suggests analysts are employed by the client in more than half of all jobs. Anecdotally however, there is a view that analysts are predominantly employed by the licensed contractor. This is supported by the number of comments made regarding that it should be a legal requirement for the analyst to be appointed by the client.

6.4 Analysts mostly conduct one (~68%) or two (~30%) 4SCs per day. However, there are occasions when three or more 4SCs will be carried out per day. Most analyst organisations (>80%) conduct multiple clearances on only a small number of days (<5days) per year but four analyst organisations conducted multiple clearances on more than 20 days per year.

General

6.5 The Inspection Programme identified a number of failings or deficiencies in terms of the expected standards for some but not all analysts and there are “practices” or “activities” which may not be compliant with legal requirements. Analysts may be placing themselves at personal risk in some cases. Some indication of the number of “occurrences” can be given while in others it has not been possible. There is some good work being done which should be recognised. Equally it is important that issues are identified and that all analysts are aware of them so that suitable improvements can be introduced.

Remedial Cleaning by Analysts

6.6 The inspection programme revealed that analysts frequently carry out remedial and cleaning work in stage 2 (the thorough visual inspection) and that these deficiencies (on the part of the licensed contractor) and analyst activities are not being acknowledged or recorded (ie not formally recorded on the certificate for reoccupation). This has serious implications regarding the standard of cleaning performed by the contractor and the standard of inspection carried out by the contractor/supervisor. The extent of remedial action is clearly linked to the adverse comments made by analysts on supervisor standards and diligence. Inadequate cleaning not only places analysts at increased risk but is also likely to contribute

to the analyst potentially breaking the law. Cleaning up asbestos licensed products dust and debris inside an enclosure requires a licence which analysts do not normally hold.

6.7 A more robust system is needed to ensure that the analyst does not start the 4SC until after the visual inspection has been completed by the supervisor to a satisfactory standard (ie no visible dust or debris). One analyst suggested a further (ie second) independent check but this would duplicate the function of the analyst. A more rigorous system is essential. Therefore, a new procedure should be introduced: The licensed contractor should complete a "Handover" document to confirm the satisfactory completion of their visual inspection process. The document should be presented to the analyst. The analyst should not start the 4SC until this document has been received and is satisfactory (ie all relevant sections completed). Where the supervisor inspection time seems inappropriately short for the size and complexity of the enclosure, the analyst should proceed cautiously during the thorough visual inspection. The suggested format of a Handover form is attached (Section 8, Appendix 3).

6.8 In addition, the clearance process needs to be supported by other rigorous measures:

- There needs to be clarification on what constitutes an acceptable amount of additional cleaning by the contractor/supervisor and on formal recording of clearance failures.
- It is recommended that further cleaning conducted by the licensed contractor during the 4SC should be limited to a maximum of 10 minutes and when exceeded, the analyst should formally issue a failure certificate. The analyst should leave the enclosure to issue the failure certificate and only re-enter to re-start stage 2 after assurances from the contractor that the additional cleaning and any necessary further inspection has been completed. Further failure certificates should be issued as necessary (ie if further additional cleaning is required)
- In line with a significant proportion of current practices, photographic evidence should be provided in the certificate for reoccupation to substantiate clearance inspection /standards and site conditions. The current provision of photographs in certificates for reoccupation by some analysts provided considerable reassurance and confidence to clients reoccupying the building. It is an example of good practice.

6.9 In view of the potential for 4SC failures, analysts should ensure that the contractual arrangements with their "employer" (ie the client or the licensed contractor) includes provision for additional site time and charges (as the need arises) to cover delays and further 4SCs caused by poor licensed contractor cleaning.

Personal Safety/Decontamination

6.10 Domestic clothing was worn underneath coveralls in some instances for clearances. Three laboratories were noted as permitting domestic clothing to be worn. Four analysts were observed wearing domestic clothing. Two analysts were not clean shaven whilst undertaking the 4SC.

6.11 The study revealed a lack of practical decontamination training for some analysts. Also certain analysts were unsure when to use the DCU. Some analysts went through the DCU (including showering) after each stage of 4SC when preliminary decontamination would probably have been sufficient. In some instances preliminary decontamination was either not undertaken or was incorrectly carried out on exiting the enclosure.

6.12 These are all health and safety issues for employers. Written procedures should set out the clothing that should be worn for clearances. Domestic clothing should not be worn inside enclosures. There should also be written procedures covering in particular when full and preliminary decontamination are appropriate. Analysts must receive practical training on decontamination procedures.

4-Stage Clearance Issues

6.13 There were numerous discrepancies, mistakes and errors in the clearance certificates. These included (i) Incorrect timings for the completion of the various clearance stages (ii) Simple mistakes in calculating and reporting the clearance indicator (iii) Insufficient time taken to count slides (iv) Disparities with sample timings recorded on certificates for reoccupation (v) Fibre concentrations and decimal places incorrectly recorded on certificates for reoccupation and (vi) Poor hand writing.

6.14 There were also poor practices and standards identified for some analysts during the 4SC site inspection. These included (i) In multiple room enclosures samples only collected from some rooms (not all) (ii) Absence of vital equipment eg brushes not used to undertake active disturbance and mirrors to aid visual inspection (iii) Insufficient time taken to count slides (iv) Unshaven analysts (v) Progressive and systematic visual inspections were not always carried out. Analysts moved randomly around enclosures potentially leading to asbestos dust/debris being missed during visual inspection (vi) DCU checks not carried out to ensure unit operational and ready for use (vii) The presence of equipment/materials, rubble and other items (inhibiting a clear visual inspection) along the transit route was not challenged.

6.15 Many of these site issues arise from the actions of the individual analyst during the 4SC (but there are also issues relating to the scoping of the work (see paragraphs 6.20-6.22)). The 4SC system relies on the analyst operating independently and impartially. It also relies on the analyst's performance at the site on the day. The analyst must be properly trained and have the correct equipment. The importance of the employer ensuring satisfactory analyst performance on-site cannot be over emphasised. Deficiencies and discrepancies can only be identified by close scrutiny of analyst behaviour, practices and outputs (including documentation) during 4SC site work. The findings highlight the need for significant monitoring and reviewing of analyst work from a health and safety perspective as well as from a management and quality control point of view to ensure that others (eg subsequent building occupiers) are not put at risk by the actions of poor performing analysts (and contractors). This applies to analyst organisations of all sizes. Quality control systems are also required by UKAS accredited bodies.

6.16 The questionnaire results indicate that some organisations are auditing more frequently than annually (eg ~7% and ~12% on a monthly and 3 monthly frequency respectively). This is good practice. However, to ensure continued satisfactory 4SC performance, the work of all analysts in the organisation should be continually assessed. Therefore, a regular programme of on-site monitoring/auditing/re-inspection (ie joint visits) should be carried out. It is recommended that ~5% of all 4SCs are audited/re-inspected and that every Analyst should be audited/re-inspected at least 4 times per annum (with reasonable intervals between re-inspections for individuals). The 4SC site auditing/re-inspection should be thorough and include all stages. Stages 2 and 4 re-inspections should be conducted immediately after the analyst has conducted the visual inspections. Details of the items to examine are listed in Table 1. The audit should also confirm whether satisfactory practices and performance were demonstrated and make recommendations for any identified training needs or procedural improvements. The purpose of the auditing is to ensure continued satisfactory performance of the analyst as well as to provide greater

confidence, accuracy and reliability in the 4SC procedure. The use of photographs in 4SC reports will also confirm the conditions and support the analyst's decisions and improve the robustness of the report.

6.17 In addition to the site auditing/re-inspection programme, desk-top reviews of a minimum of 5% of completed 4SC certificates for re-occupation should be carried out. These desk top reviews should be conducted by quality managers or other technically competent individuals. The desk top review should be checking for satisfactory 4SC site procedures and analytical details. The items to be checked are listed in Table 2. The desk top audit should also confirm whether satisfactory practices and performance were demonstrated and make recommendations for any identified training needs or procedural improvements.

6.18 Where monitoring and review of analyst performance identifies particular issues these should be addressed through prompt action which can include instructing, advising, coaching and demonstrating. In addition, refresher training can also be given where necessary. The quality and consistency of all work carried out should be kept under regular review.

6.19 Analysts must receive refresher training in line with the requirements of the ACOP L143. Refresher training should reflect the level of competence and specific training needs of the individual involved. It should include as appropriate reinforcing procedures such as: correct choice of PPE, decontamination arrangements, the use of the DCU, use and maintenance of RPE.

6.20 Many of the site clearance issues are also related to the limited (or non) involvement of the analyst in the initial scoping the work and the setting up of formal arrangements for the 4SC. The 4SC needs to be properly scoped by the analyst (ie covering the extent, duration and complexity etc) in a timely manner to enable adequate planning and sufficient clarity in the clearance process requirements and the allocation of sufficient resources. The scoping exercise is also required to enable the analyst to conduct an adequate risk assessment and to prepare a suitable POW.

6.21 The analyst POW must cover all aspects of the 4SC process. It must cover the risks from asbestos taking account of the layout and complexity of the site and the potential for dust disturbance. It should cover additional risks caused by poor licensed contractor cleaning. It must also take account of non-asbestos risks including work-at-height, confined/restricted spaces, electrical/gas/isolation, lone-working etc.

6.22 In line with the requirements of CDM 2015 (see paragraph 1.9), the analyst will need to be provided with sufficient information and detail before the 4SC starts to enable a risk assessment and a site specific POW to be prepared. This should be achieved through a pre-removal site visit. If this is not practical, then the analyst must be provided with a copy of the contractor's POW or sufficient detail on the nature of the work eg site layout and complexity (including voids, ducting, cavities, ledges, cabling etc), ACMs involved (quantity type etc), access etc. This is a formal contractual arrangement and property client and the licensed contractor have legal duties to cooperate with the analyst and to provide the analyst with adequate information in a timely manner (CDM 2015). The analyst POW should be available for inspection on site.

Table 1: Recommended Site Auditing Protocol for Assessing Analyst 4SC Work

Check the following:

Handover Form is received and is satisfactory

Site specific documentation (POW, Analyst's risk assessment etc) is present and checked

Correct PPE and RPE is worn

Correct decontamination procedures are followed

Correct items are checked in Stage 1

Thorough check is made of transit and waste routes and correct conclusion (ie free from debris)

Sufficient time is spent on Stage 2 thorough visual inspection

Any Stage 2 matters are dealt with appropriately and recorded eg formal failure certificate is issued if more than 10minutes cleaning is required

Correct equipment is used for thorough visual inspection (eg access equipment, mirrors, torches etc)

Correct sampling locations and times and disturbance methods and periods are used for Stage 3 air sampling

Analysis time was sufficient for air samples

Stage 4 visual inspection was thorough

Photographic evidence is provided to verify clearance inspection results/standards and site conditions, and to provide reassurance to occupier.

Table 2: Recommended Desk Top Auditing Items to be checked in 4SC Certificates for Reoccupation

Check the following:

Site

Suitable timings for individual 4SC stages

Sufficient time is spent on Stage 2 thorough visual inspection

Any Stage 2 matters are dealt with appropriately and recorded eg formal failure certificate is issued if more than 10minutes cleaning is required

Laboratory Analysis:

Satisfactory number of graticule areas examined

Correct calculations

Satisfactory time taken to count individual slides

Clearance of DCUs

6.23 The study revealed that DCU clearances were being undertaken at the same time as stage 3 of the 4SC. This is acceptable but the DCU must remain in-situ and operational until the certificate for reoccupation is finally issued. If the DCU has to be re-used (eg following a stage 3 or 4 failure), then it will have to be re-cleaned and a further clearance carried out.

Personal sampling

6.24 Analysis of the personal sampling data carried out on behalf of licensed contractors revealed that the sampling was short duration and was often the minimum time to comply with the statutory requirements eg 10 minutes. In addition, there was little contextual information to describe the circumstances and conditions. Typically the comment “removal works” was the only descriptor of the work being carried out. The most appropriate activities or personnel may not have been assessed.

6.25 These sampling periods and limited contextual information provide little meaningful data or value to the licensed contractor in assessing work methods, exposures and performance of controls. The data will not be representative of conditions and will be of little value (indeed could be misleading) in preparing risk assessments and exposure estimates. It will not be an accurate measure of worker exposure for personal records.

6.26 Significant improvements in personal sampling and information recording need to be made. Personal sampling must reflect the nature of the work performed and the circumstances and conditions at the time of sampling. The appropriate workers need to be selected ie those directly involved in asbestos removal. In addition, accurate information needs to be collected on the following: (i) The tasks performed by the worker during sampling (including task duration if possible) (ii) The other factors that will influence exposure including how the tasks were performed (tools, equipment etc. and methods and techniques) and (iii) The controls that were employed.

6.27 The sampling period must be sufficient to ensure it is fully representative of the work. Sampling periods should normally be for the duration of the enclosure shift (eg 2-3 hours or more).

6.28 The analyst is best placed to advise the licensed contractor on the personal sampling that will be most informative and generate meaningful data to meet their requirements on exposure and control monitoring. The analyst should advise the licensed contractor on effective and meaningful personal sampling and on the extent of contextual information to be collected.

Analyst Views

6.29 Most of the organisations that took part in the study were of the opinion that the analyst should only be engaged by the property owner or occupier and not the licensed contractor.

7 RECOMMENDATIONS

The Analyst Inspection Programme has identified that there needs to be more rigorous and robust systems in various areas of analyst work particularly regarding health and safety matters, personal monitoring, analyst engagement for the 4SC and for carrying out the 4SC process. There also needs to be high standards of quality control. The following recommendations are made in these respects:

7.1 Analysts should be involved in the scoping stage of the licensed removal work to ensure that a suitable POW can be prepared and that sufficient resources can be allocated for the 4SC. This should be achieved through a pre-removal site visit. If this is not practical, then the analyst must be provided in a timely manner with a copy of the contractor's POW or sufficient detail on the nature of the work eg site layout and complexity (including voids, ducting, cavities, ledges, cabling etc), ACMs involved (quantity type etc), access etc. This is a formal contractual arrangement and the property client and licensed contractor have legal duties to cooperate with the analyst and to provide the analyst with adequate information in a timely manner (see paragraphs 6.20-6.22).

7.2 In view of the potential for 4SC failures, analysts should ensure that the contractual arrangements with their "employer" (ie the property client or the licensed contractor) includes provision for additional site time and charges to cover delays and further 4SCs caused by inadequate licensed contractor cleaning (see paragraph 6.9).

7.3 The analyst should not start the 4SC until a completed Handover Form has been received from the licensed contractor (see paragraph 6.7). The form must be satisfactory.

7.4 There should be a time limitation on the extent of cleaning by the licensed contractor that is acceptable during the 4SC. The time should be limited to a maximum of 10 minutes and when exceeded, the analyst should formally issue a failure certificate (further details are given in paragraph 6.8).

7.5 Photographic evidence should be provided in clearance certificates to verify/substantiate clearance inspection results/standards and site conditions. The photographs will provide considerable reassurance to clients for subsequent reoccupation of the building. Photographs will also provide greater robustness to analyst's work and the 4SC process.

7.6 Employers should provide clear written procedures on the nature of clothing that should be worn for clearance work. Domestic clothing should not be worn inside enclosures. There should also be clear written decontamination instructions including descriptions explaining when full and preliminary decontamination procedures are appropriate. Practical training on decontamination procedures must also be provided.

7.7 Discrepancies, deficiencies and omissions identified in the Inspection Programme should be addressed through a combination of improved quality control and assessment and auditing, and through refresher training, coaching and instructing. The work of all analysts in the organisation should be continually assessed. A regular programme of on-site monitoring/auditing/re-inspection (ie joint visits) should be carried out. It is recommended that ~5% of all 4SCs are audited/re-inspected and that every analyst should be audited/re-inspected at least 4 times per annum (with reasonable intervals between re-inspections for individuals). The 4SC site auditing/re-inspection should be thorough and include all stages. Stages 2 and 4 re-inspections should be performed immediately after the analyst has conducted the visual inspections. In addition, at least 5% of 4SC certificates for occupation should be reviewed in desk top studies. More details are presented in paragraphs 6.16-6.17 and Tables 1-2.

7.8 The analyst should advise the licensed contractor on effective and meaningful personal sampling (duration and activities to be covered) and on the extent of contextual information to be collected (more details in paragraphs 6.24-6.28).

7.9 It is recommended that this Analyst Inspection programme is repeated after the introduction of the revised Analyst Guide (HSG248).

8 APPENDICES

APPENDIX 1: LETTER AND QUESTIONNAIRE

LETTER SENT WITH THE QUESTIONNAIRE

Dear Sir / Madam (or name),

You may be aware of a pilot project running in the North-West of England, inspecting the work of analysts in the asbestos industry. HSE will be extending these inspections nationwide in the year from April 2014 with the expectation that we will visit a significant proportion of analyst laboratories, carrying out both site and Head Office visits.

The reasons for these inspections are two-fold: firstly, to allow HSE to gain an insight into current work practices of analysts – an area which we have historically not inspected very often – and, secondly, to assess compliance with the standards set out in the Analyst Guide (HSG248).

Prior to this project starting and in order for us to get some more information about the industry, we would like all analyst laboratories to complete a short questionnaire, which is attached. This should take no more than a few minutes of your time and completed questionnaires should be sent to **(HSE email address removed from letter)** no later than **Friday 17 January 2014**. I appreciate that much of the information we are asking for may be commercially sensitive however you can be assured that it will remain totally confidential.

If you have any comments or questions about this project, please send them in the first instance to my email address above.

Thank you very much in anticipation of your help.

Regards

(Inspectors name removed)

HM Inspector of Health & Safety
Asbestos Licensing Unit
Health & Safety Executive
Belford House
59 Belford Road
Edinburgh
EH4 3UE

QUESTIONNAIRE SENT TO UKAS ACCREDITED LABORATORIES

Please mark X in the box where appropriate.

1) How many 4-stage clearances has your laboratory carried out in the year from 1 January 2013 to 31 December 2013?

2) How many people in your laboratory are involved in carrying out 4-stage clearances?

3) On average, how many 4-stage clearances would an individual analyst normally carry out in a working day?

1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 (or more) ☐

4) On average, how often do individual analysts in your laboratory carry out 3 or more 4-stage clearances in a day?

Less than 5 days per year ☐ Between 5 & 10 days per year ☐

Between 10 & 20 days per year ☐ More than 20 days per year ☐

5) How often do you audit the site activities of your analysts involved in carrying out 4-stage clearances?

Once a month ☐ Once every 3 months ☐ Once every 6 months ☐

Once a year ☐ Never ☐

6) In the year 1 January 2013 to 31 December 2013, approximately how many 4-stage clearances have:

- Been failed (i.e. a fail certificate issued)?
- Required on-site action (e.g. additional cleaning) to obtain a pass?

7) Approximately how many clients have you carried out 4-stage clearances for within the year 1 January 2013 to 31 December 2013?

Less than 10 ☐ Between 10 & 19 ☐ Between 20 & 49 ☐

Between 50 & 99 ☐ More than 100 ☐

8) For approximately what percentage of these 4-stage clearance jobs were you engaged directly by:

- The licensed contractor?
- The client / property owner?

9) On what basis do you price your 4-stage clearance jobs; e.g. size of job; area involved; complexity of site; duration of job; fixed fee; other (please give details)?

10) Do you issue photographs as part of the 4-stage clearance certificate?

- Yes ☐
- No ☐

11) Do you have any other comments or information that you think would be useful?

APPENDIX 2: HEAD OFFICE & SITE VISIT INSPECTION AIDE MEMOIRE

	HEALTH AND SAFETY EXECUTIVE Analyst Inspection Programme 2014 – 2015 Head Office & 4SC Inspection Aide Memoire
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Analytical Laboratory	
Regulatory Inspector	
Specialist Inspector	

NOTE: Use the Additional Comments page if you don't have enough space in the comments box provided and reference to the relevant section as appropriate. Make extra photocopies of the Executive Summary and Additional Comments pages as required and paginate the whole report once completed. Please summarise the key issues in the Executive Summary.

Executive Summary

PART A - HEAD OFFICE INSPECTION

- 1) Check Laboratory's working practices, policies and procedures.
- 2) Obtain information for further detailed examination back at the office:
 - Written procedures for entering enclosures and decontamination (usually contained in UKAS Manual)
 - Copy of most recent UKAS audit report
 - Personal sampling and leak testing procedure (usually contained in UKAS Manual)
 - Most recent personal sampling (PS) air test certificates (PS done for client/licensed contractor)
 - Most recent PS air test certificates for PS carried out on the Laboratory's own Analysts for H&S reasons.
 - Select one analyst - Collect details of all work carried out by analyst in last week. Obtain their most recent 4SC certificates of reoccupation (identify and collect, where appropriate, a number of slides for re-examination by HSL – use guidance on visual inspection of microscope slides to help)

Section 1 - General information			
Head Office Address			
Branch Office(s)			
UKAS No.			
Year started trading			
Any close association / co-ownership with removal contractor(s)			
Name of HSE Inspector(s)		HSE office(s)	
Date of visit			

Section 2 - Analysts (Laboratory policies / procedures)

Number of Analysts employed by laboratory?

Number of people authorised to count slides (i.e. participate in RICE scheme)

Section 2.1 - Work load / Working Environments

Total number of 4SC undertaken per week/month/year (approx.)

Number of 4SC each analyst can undertake, each day. Check Management System/UKAS Manual to see what determines the maximum number and systems in place to manage – look at how 4SC jobs are booked in and allocated to Analysts. Discuss Laboratory concerns with booking in 4SC/Air testing jobs with Licensed Contractors (What are the problems they encounter?)

Geographic coverage

Where majority of work undertaken - estimation of daily travelling time(s) by analyst

Principal environments 4SC undertaken.

industrial / hospital / educational / office / warehouse / residential / retail / leisure etc

Source of work: Client/Licensed Contractor (estimate percentage)

<p>Does the Laboratory use a fixed price for 4SC? If so what happens when the 4SC fails or delays occur? (Check margins for 4SC failure and systems in place to manage)</p>	
<p>Type of work typically carried out? (4SC, leak, reassurance, personal, environmental, background, removal supervision, etc)</p>	
<p>Section 2.2 - Training Programme</p>	
<p>New (untrained) recruits:</p> <ul style="list-style-type: none"> • Health and safety • Quality management system • Competence assessment • Qualifications (P403, P404) 	
<p>Qualified recruits:</p> <ul style="list-style-type: none"> • Health and safety • Quality management system • Competence assessment • Qualifications (P403, P404, S301, CoCA, LFOH etc) 	

Section 2.3 – Target areas (Discuss with Head Office)

Analyst H&S (entry/exit procedures):

- Formal Procedures? Obtain copy (usually in Labs UKAS Manual)
- Work clothes worn under coveralls?
- Wear 2 coveralls?
- In what scenarios are Analysts required to transit/decontaminate in the decontamination unit?
- What RPE/PPE is worn to re-enter enclosure to collect pumps?
- How equipment decontaminated?

Personal sampling (PS) during asbestos removal works:

- Obtain most recent PS certificates for further detailed examination back at the office (**see NOTE**)
- Formal PS sampling Strategy? (usually in Labs UKAS Manual)
- Type of PS undertaken? (Licensed contractors employees)
- What circumstances? (during project management, on behalf of client or licensed contractor)
- How long sampling periods? (What is written in the formal PS strategy)
- Actions taken by Analyst if levels above control limit / sporadic and low intensity exposure (SALI)?

Other areas for consideration:

- Type of RPE worn for 4SC? (include details of filter/s)
- Type of RPE/PPE used for clearance of hygiene facilities? (include details of filter/s)
- Reuse of brushes? (Is it allowed?)
- Leak testing: (formal leak sampling strategy (usually in Labs UKAS Manual), check strategy for location of sampling pumps (airlock, NPU) but what about other locations around enclosure/area, what guidance is given to Analysts, length of sampling periods (<1-hour?))

NOTE: Don't examine the PS Certificates during the Head Office visit, examine the certificates in detail back at the office. When back at the office check the PS Certificates for compliance against the Analysts Guide and whether sufficiently detailed, particularly for the following:

- Length of sampling period, who was sampled and why, how many workers, what work was going on during sampling and the contextual information on sampling (Is it meaningful and of sufficient detail)

Section 2.4 - QC Procedures

External quality control:

Is the Laboratory assessed by UKAS for compliance with ISO 17025 and ISO 17020?

Obtain copy of most recent UKAS audit report. Highlight any issues raised by UKAS.

Does the laboratory participate in the RICE Scheme?

How has the laboratory performed in the RICE Scheme in the last 12 months? Highlight any issues.

Internal quality control:

How are Analysts audited on site for continued competency in undertaking 4SC, air testing and certification of hygiene facilities? (What is the criteria for acceptable performance)

How often are Analysts audited?

What procedures are in place if an Analyst fails an on-site audit?

Have any Analysts failed an on-site audit in the last 12 months? Highlight any issues.

How often are Analysts 4SC and Air Test Certificates audited? What happens if corrective action is required?

Is personal sampling undertaken on the Laboratory's own Analysts? If Yes, when is it carried out and how is the information used?

Obtain most recent PS air test certificates for PS carried out on the Laboratory's own Analysts for H&S reasons.

Number of graticule areas examined in any 8 hour period? (Should not exceed 2400)

What procedures are in place if exceeds 2400?

NOTE: Don't examine the PS Certificates for the Analysts during the Head Office visit, examine the certificates in detail back at the office. When back at the office check the PS Certificates for compliance against the Analysts Guide and whether sufficiently detailed, particularly for the following:

- Length of sampling period, what work was going on during sampling, the airborne concentration and the contextual information on sampling (Is it meaningful and of sufficient detail)

Section 3 – Analyst (Individual)

Select one analyst - Collect details of all work carried out by analyst in last week. Obtain their most recent 4SC Certificates of reoccupation (identify and collect, where appropriate, a number of slides for re-examination by HSL – use guidance on visual inspection of microscope slides to help).

Section 3.1 – General information (To be gathered during Head Office visit)

Name of Analyst?				
Age?	less than 18 years	19 - 24 years	25 - 34 years	35 - 44 years
	45 - 54 years	55 - 64 years	65 years or older	
Experience (years)?	up to 1 year	between 2 - 3 years	Between 4 - 5 years	
	between 6 - 10 years	more than 10 years		
Principal Role?	Analyst	Asbestos Surveyor	Bulk Analyst	Project Manager
	H&S Practitioner	Occ. Hygienist	Management	
Qualifications?	P403	P404	S301	
	CoCA	LFOH	CMFOH	
Number of Air tests?	< 5 each month	6 - 10 each month	11 - 20 each month	> 20 each month
Number of 4SC?	< 5 each month	6 - 10 each month	11 - 20 each month	> 20 each month

NOTE: Examine the 4SC Certificates of reoccupation in more detail back at the office. During the Head Office visit use the 4SC Certificates to determine whether any microscope slides should be sent to HSL for analysis. When back at the office check the 4SC Certificates for compliance against the Analysts Guide and whether sufficiently detailed, particularly for the following:

- Timings for each stage of the 4SC process: particularly the visual inspection, air sampling (sample numbers compared to size of enclosure and volume collected), disturbance air test (how carried out), and fibre counting (i.e. prepare/mount, examine slides and report)
- How difficult and complex does the 4SC seem based on what has been recorded on the certificate and is the description of the removal work and the amount/types/locations of ACMs (removed or remaining) of sufficient detail.
- Check that the recorded air sampling results have been calculated and interpreted correctly, and number of graticule areas counted in 8-hour period (if possible)

Section 4 - PART A Additional Comments (Reference to sections where applicable)

PART B – 4SC INSPECTION

Section 1 - General information	
Site Address:	
Date:	
Analyst Name:	
Employed by (Contractor/Client):	
Asbestos type removed:	
Work carried out per Plan of Work (PoW)? Note any discrepancies	
Supervisor visually inspected enclosure and work area prior to 4SC?	

Section 2 - 4SC Stage 1 PRELIMINARY CHECKS	
Analyst inspected the PoW? <i>Should cover - what ACMs removed, ACMs remaining in situ, where ACMs located, diagram, set up etc</i>	
If discrepancies found in PoW compared to work carried out, did analyst query?	
Did Analyst inspect: 1) DCU (hot / cold water, heating, cleanliness). Type of RPE/PPE worn whilst inspecting showers & dirty end of DCU? 2) Transit & waste routes? 3) Enclosure integrity? 4) Adjacent areas for asbestos contamination?	

<p>5) Provisional inspection of enclosure / area via CCTV / viewing panel</p> <p>6) Check all appropriate equipment in enclosure / air lock. i.e. vacuum cleaner, water bucket + sponges, lighting etc</p> <p>7) Verify with contractor that Analyst to be accompanied during visual inspection at Stage 2.</p> <p>8) Record findings <u>before</u> moving onto Stage 2.</p>	
Any Failures? Reasons?	
Sufficient time taken to complete Stage 1?	

Section 3 - 4SC Stage 2 VISUAL INSPECTION

Any discrepancies with Analyst Guide when entering enclosure?	
Tools taken into enclosure? i.e. torch, knife, wet wipes etc	
Undertakes progressive inspection?	
Fails visual? Reasons?	
Type of mask worn? (half, full, disposable and type of filter)	
Analyst undertakes any cleaning themselves? Reasons?	
Sufficient time taken to complete Stage 2?	

Any discrepancies with Analysts Guide when exiting enclosure?	
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Section 4 - 4SC Stage 3 AIR TESTS

Brush used for dust disturbance? If not, what?	
Dust disturbance sufficient duration? 1.5 min. per sample location	
Sufficient number of air samples taken?	
Was fibre counting undertaken in clean area?	
Sufficient time taken to prepare / mount, examine slides and report (counters may take 10 – 25 min to count each slide)	
Sufficient time taken to complete Stage 3?	

Section 5 - 4SC Stage 4 ENCLOSURE REMOVAL

Analyst re-inspects the area?	
Decontamination unit clearance air test carried out? (Once enclosure air test OK?)	

Section 6 - 4SC Other

Photographs taken?	
Who received a copy of the 4SC Certificate of reoccupation?	

Section 7 - PART B Additional Comments (Reference to sections where applicable)

APPENDIX 3: LICENSED CONTRACTOR'S HANDOVER FORM FOR ANALYST

This document explains that the Licensed Contractor should ensure that the asbestos enclosure or work area has been thoroughly cleaned by the contractor and that a thorough visual inspection has been completed by the contractor.

The licensed contractor should complete a "Handover Form" which should be given to the Analyst before the 4-stage clearance starts. The Analyst should not start the clearance until the Handover Form has been received and is satisfactory. The Analyst should sign and date the form.

Cleaning the enclosure is licensed work. It must not be carried out by the Analyst.

After licensed asbestos removal work, there is a legal requirement for the premises to be thoroughly cleaned (Control of Asbestos Regulations 2012, Regulation 17). This cleaning is the legal responsibility of the licensed contractor.

After cleaning has been completed, the licensed contractor (for example the supervisor) should carry out a thorough visual inspection of the enclosure (including airlock and baglock)(or work area in the absence of an enclosure) in preparation for the "handover" of the site to the analyst for the independent 4-stage clearance procedure.

This visual examination by the supervisor should be sufficiently thorough to ensure that the cleaning has been completed to a satisfactory visual standard (ie there should be no visible dust or debris).

The licensed contractor should complete the "handover" document (including the signed declaration) to confirm the satisfactory completion of this process. The document should be presented to the analyst. The suggested Handover Form is attached.

The analyst should not start the independent clearance until the handover document has been received and is satisfactory. The analyst should sign and date the form.

In summary, the contractor should not arrange for the 4-stage clearance procedure to start until satisfied that:

- All the asbestos has been removed as detailed in the POW;
- The area inside the enclosure and airlocks is both clean and dry and has already passed their own thorough visual inspection;
- A Handover Form has been prepared for the analyst;
- Sealant has not been applied.

Handover Form Licensed Contractor's Thorough Visual Inspection Form (to be passed to analyst before 4-stage clearance starts) Copy to be retained by Licensed Contractor	
Objective: To carry out the thorough visual inspection of Enclosure/Work Area. Areas to be clean from visible debris and dust	
Site Address	
Size of enclosure? (see POW) (LxWxH (metres))	
	Yes (Tick to confirm)
Full access obtained?	
Has the NPU been switched off and new pre-filter inserted?	
Have all ACM removal locations been checked and certified as free from asbestos?	
Have all floor surfaces/walls/items been inspected and are confirmed as visually clean?	
Have all ledges, sills, higher level surfaces (including voids where appropriate) been inspected and are confirmed as visually clean	
Have ACM removal locations been checked and confirmed as visually clean?	
Have all rooms been checked and confirmed as visually clean?	
Have all cables, wiring any items to remain in enclosure during the 4-stage clearance been checked and confirmed as visually clean?	
How long did the supervisor's visual inspection take? Start Time: Finish Time: Total time: Hours/minutes	
I certify that I have carried out a thorough visual inspection of the enclosure/work area and can confirm that the area is visually clean and ready to be made available to the analyst for the independent 4-stage clearance	Supervisor's signature, date and time
Form to be handed to analyst before 4-stage clearance starts Analyst's Signature, Date and Time	