



# **Manual Stack-Emission Monitoring Guidance for Personnel and Organisations**

**Environment Agency  
Version 4.3  
June 2009**





## Record of amendments

Version number	Date	Amendment
3	May 07	3.1 – added information about Level 2 personnel with limited scope certification
		3.3 – explained that a standard personal stack monitoring record form must be used.
		3.7 – added guidance on experience required to become Level 2 certified.
		3.8 – added new section on recertification.
		Annex – added form for recording work experience.
4	May 08	3.3 - work records must be approved, although this does not have to be by signature.
		3.9 – added guidance on the Code of conduct
		Annex 3 – added Code of conduct
4.1	Sept 08	Figure 5, Note 1 - changed recertification requirements relating to regaining technical endorsements that have expired.
4.2	Dec 08	3.4 – extended TE1 to include measurements of oxygen.
4.3	June 09	3.3 – added information on confirming work experience
		3.8 - clarified that Level 2 personnel must show they meet the re-certification requirements within the time limit specified
		3.9 and Annex 2 - specified that personnel must follow the health and safety principles in TGN M1
		5 – updated references

## Status of this document

This MCERTS performance standard may be subject to review and amendment following publication of this document. The latest version of the standard, together with guidance on the scheme, is available on our website at [www.mcerts.net](http://www.mcerts.net).

## Feedback

If you have any comments on this document please contact Rupert Standring at [Rupert.Standring@environment-agency.gov.uk](mailto:Rupert.Standring@environment-agency.gov.uk)



## **Foreword**

We set up our Monitoring Certification Scheme (MCERTS) to provide a framework of standards you can use to monitor things that affect the environment. MCERTS covers:

- the standards of performance that your monitoring equipment must meet;
- the level your staff must be qualified to; and
- accrediting laboratories and inspecting sites in line with European and international standards.

You may apply to MCERTS as a person or an organisation.

## **Organisations**

Under MCERTS, organisations must be accredited by the United Kingdom Accreditation Service (UKAS) to show they have reached the MCERTS performance standard for organisations. This standard focuses on how you should plan, carry out and report on the work you do to monitor pollution from chimney stacks.

## **People**

Under MCERTS, people must receive a certificate based on:

- their experience;
- training they have taken part in; and
- exams they have taken.

Sira Certification Service runs this scheme on our behalf and is approved to do so by the United Kingdom Accreditation Service (UKAS).

This document provides guidance on getting an accreditation (for organisations) or getting a certificate (for people) to show you meet the MCERTS conditions.

## **The benefits of MCERTS for measuring pollution from chimney stacks**

- MCERTS makes sure that information about pollution released from chimney stacks is reliable.
- Everybody in the competitive market of monitoring pollution from chimney stacks will be working towards the same standard.
- The standard sends a message that measuring pollution from chimney stacks is an important part of producing reliable information for regulatory purposes.
- By setting quality standards, which everybody must work towards, the standard promotes and raises the professional reputation of people and organisations involved in monitoring pollution from chimney stacks.

If you have any questions about getting an accreditation for your organisation, please contact:

UKAS  
21 – 47 High Street  
Feltham  
Middlesex  
TW13 4UN.

Phone: 020 8917 8400  
Fax: 020 8917 8500  
E-mail: [info@ukas.com](mailto:info@ukas.com)

If you have any questions about getting a certificate (if you are applying as an individual) or would like more information about how to apply, please contact:

Sira Certification Service  
12 Acorn Industrial Park  
Crayford Road  
Crayford  
Dartford  
Kent  
DA1 4AL.

Phone: 01322 520500  
E-mail: [mcerts@siraenvironmental.com](mailto:mcerts@siraenvironmental.com)

You can get more information on MCERTS, including the standards related to monitoring pollution from chimney stacks, from our website at [www.mcerts.net](http://www.mcerts.net).

If you have any general questions about MCERTS, please contact Rupert Standing at [rupert.standing@environment-agency.gov.uk](mailto:rupert.standing@environment-agency.gov.uk)

Plain English Campaign's Crystal Mark applies to the foreword only.



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# Manual stack-emission monitoring guidance for personnel and organisations

## 1. Introduction

This document provides guidance on MCERTS for manual stack-emission monitoring. It is aimed at personnel involved in stack-emission monitoring and also those responsible for the operation of stack-emission monitoring organisations.

It should be used in conjunction with the *MCERTS performance standard for organisations* and the *MCERTS performance standard for personnel*. Both documents are available on our web-site at:

[www.mcerts.net](http://www.mcerts.net)

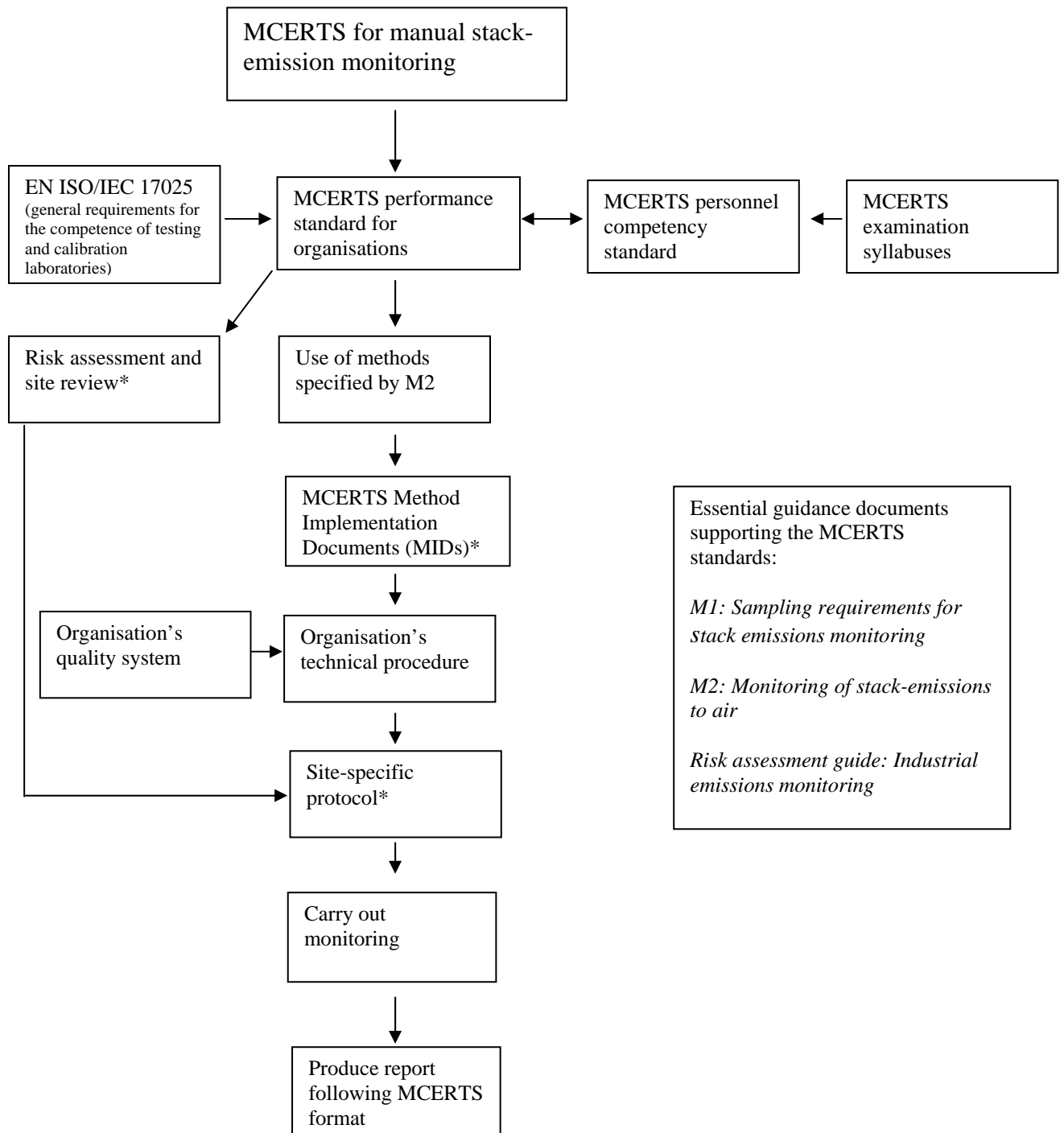
The guidance in this document covers the following areas:

- structure of the scheme
- the personnel standard
- how personnel apply for MCERTS certification
- how personnel progress through the competency levels
- format of examinations
- recertification of personnel
- accreditation of organisations
- how organisations apply
- how organisations become accredited.

## 2. Structure of MCERTS for manual stack-emission monitoring

Figure 2.1 outlines the structure of MCERTS for manual stack-emission monitoring. It shows how the scheme is split into two components: the certification of personnel and the accreditation of organisations. It also outlines the requirements of the MCERTS performance standard for organisations (further explanations of these are provided in section 4).

**Figure 1: Overview of the structure of MCERTS for manual stack-emission monitoring**



\*Explanations of the role of MIDs, site reviews and site-specific protocols are provided in section 4.

### 3. The personnel standard

#### 3.1 Structure of the personnel standard

The MCERTS personnel standard defines the competency requirements for personnel carrying out manual stack-emission monitoring. Although MCERTS accredited organisations must use MCERTS certified personnel to carry out stack-emission monitoring activities, the MCERTS certification is awarded to individuals and not to the organisation for which they work. It is therefore the responsibility of the individual to keep all records associated with their personnel certification.

The MCERTS personnel competency standard enables stack-emission monitoring personnel to be certified as competent based on experience, training and examinations. Figure 1 summarises the structure of the standard.

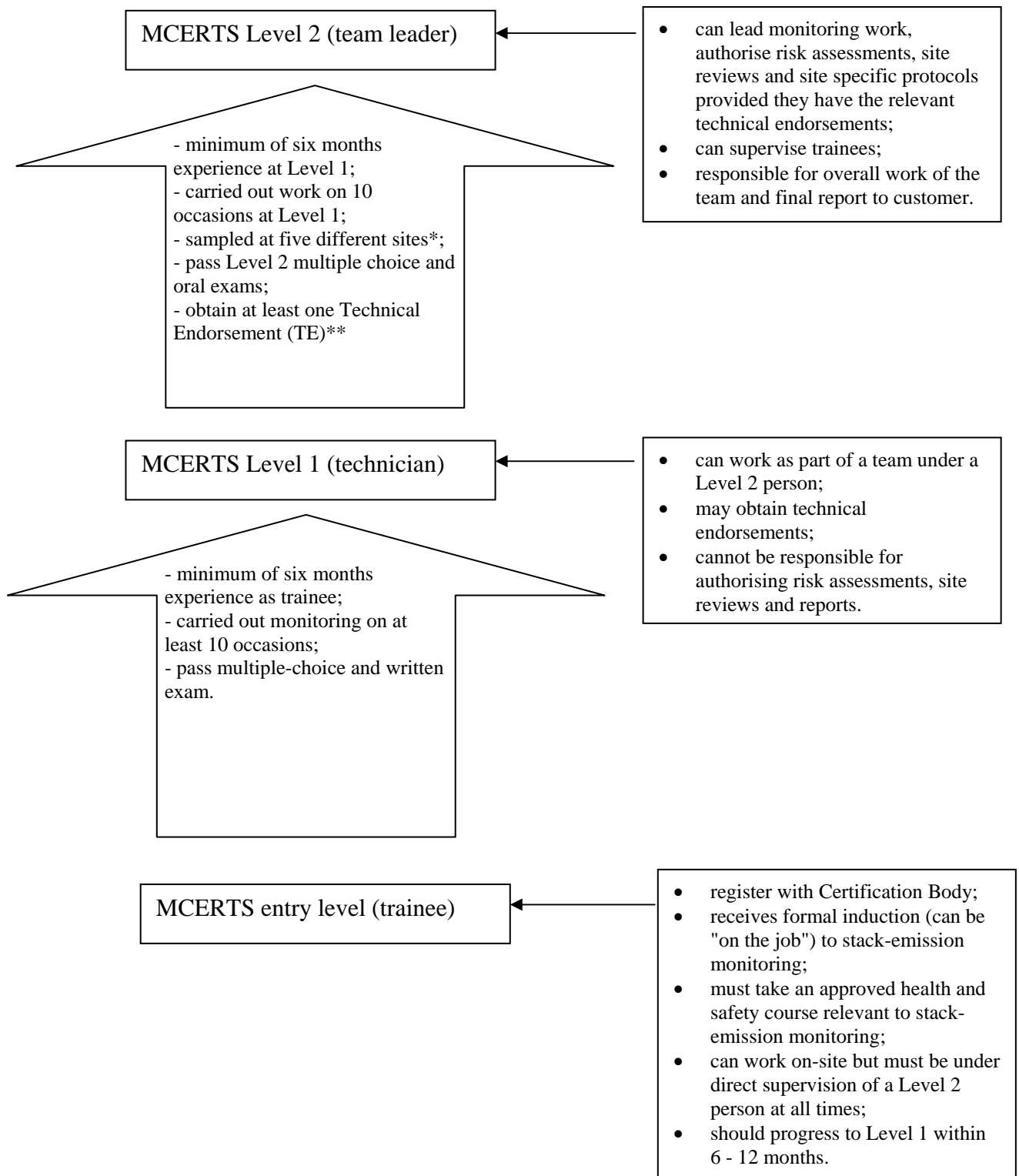
**MCERTS entry level (Trainee)** - Entrants into the stack monitoring profession will register as trainees, and undergo a formal induction to the industry and supervised in-house training. This includes a requirement to attend an approved course on hazard identification and risk assessment relating to stack emission monitoring. Trainees are allowed to conduct stack-emission monitoring only under direct supervision of a Level 2 person. It is envisaged that most individuals will progress from a trainee to MCERTS Level 1 in six to 12 months.

**MCERTS Level 1 (Technician)** - This requires understanding of the principles of manual stack-emission monitoring. Personnel achieving this standard are competent to conduct stack-emission monitoring as part of a team led by a Level 2 person.

**MCERTS Level 2 (Team Leader)** - This requires advanced competence and understanding of manual stack-emission monitoring. This is the level required for individuals to be able to supervise other stack-emission monitoring personnel and lead campaigns. A Level 2 person must have technical endorsements relevant to the substances being monitored.

**MCERTS Level 2 Limited scope** - Personnel who do not have the opportunity to carry out monitoring at five different sites can still be certified (see section 3.5). However, the scope of certification shall be limited to the sites they work at. As limited scope personnel do not tend to have as broad a range of experience as personnel who work on five sites or more their oral exam may not cover topics in the same range or depth. The oral exam for personnel with limited scope will be specific to the sites they have worked at. Personnel with limited scope certification can have the limitation to their scope removed by meeting the experience requirements in figure 1 and passing the oral exam for personnel who work on five sites or more.

**Figure 2: MCERTS competency levels for individuals**



\* Personnel can obtain MCERTS certification to Level 2 if they work on less than five different sites. However, their certification is limited to the sites specified on their work records.

\*\* Limited technical endorsements are available for personnel who have limited scope certification. These endorsements apply to personnel who use one monitoring technique only. They are available for TE3 and TE4.

### **3.2 Applying for certification**

Sira Certification Service (Sira) operates the personnel scheme on our behalf. Information on certification is provided by Sira at:

[www.sira.co.uk/mcerts](http://www.sira.co.uk/mcerts)

If you have any questions regarding the certification process, or would like further information on making an application, please contact:

Sira Certification Service  
12 Acorn Industrial Park  
Dartford, Kent.  
DA1 4AL

Tel: +44 (0) 1322 520500

Email: [mcerts@siraenvironmental.com](mailto:mcerts@siraenvironmental.com)

### **3.3 Confirmation of work experience**

Individuals must submit a confirmation of work experience to demonstrate they meet the experience requirements.

The confirmation of experience should be approved by a Level 2 person with the appropriate technical endorsements. Approval may be by signature or, if an electronic format is used, approval may be given by typing the names on the form. The form is provided by Sira and is completed during the application process.

MCERTS accredited organisations will have records of the site work their personnel carry out. However, it is recommended that personnel also maintain their own records. An example form, that personnel may wish use to record work experience, is provided in Annex 1. Please note this form does not have to be submitted to the certification body.

### **3.4 Progression through the scheme**

Personnel must fulfil the experience requirements stated in the MCERTS personnel competency standard (see Figure 3.1 of this document). These specify the minimum number of occasions and sites that personnel have undertaken manual stack-emission monitoring on, and the length of time required before a candidate can enter for the relevant examinations to progress in the scheme.

Assessment of competency is by examination. These include written papers, multiple-choice papers and for Level 2 there is also an oral examination. The MCERTS examination syllabuses, covering the competency requirements and outlining how candidates are assessed, are available from:

[www.mcerts.net](http://www.mcerts.net)

To obtain certification to Level 1 trainees must pass a multiple choice and a written examination. To obtain Level 2 individuals have to pass an oral examination, as well as obtaining one or more of the following technical endorsements:

### **Particulate monitoring by isokinetic sampling techniques (TE 1)**

This covers the fundamental concepts of particulate monitoring by isokinetic sampling techniques. This includes supporting measurements for water vapour and oxygen.

### **Multi-phase sampling techniques (TE 2)**

This covers isokinetic sampling for a wide range of species in the particulate and vapour phases. The species include metals trace organic micro-pollutants, such as dioxins/furans, PCBs, and PAHs. TE 1 is a prerequisite for this endorsement.

### **Gases/vapours by manual techniques (TE 3)**

This covers the monitoring of gases and vapours by manual techniques, which includes adsorption onto sorbent tubes and impinger solutions. The species include organic compounds, halides and halogens.

### **Gases/vapours by instrumental techniques (TE 4)**

This covers the monitoring of gases and vapours by instrumental techniques. The species include CO, O<sub>2</sub>, SO<sub>2</sub>, NO and NO<sub>2</sub> by various techniques and total organic compounds by FID.

### **Particle-size fractionation by isokinetic sampling techniques (TE 5)**

This covers particle size fractionation monitoring. TE 1 is a prerequisite for this endorsement.

Level 2 personnel may only take responsibility for stack-emission monitoring covered by the technical endorsements they hold.

To obtain TE1 personnel must carry out methods relevant to this on five occasions at Level 1 and pass the relevant examinations. TE1 is a key endorsement because:

- obtaining TE1 allows personnel to take the other endorsements without having to carry out methods specific to them;
- only personnel who have obtained TE1 can take TE2 and TE5;

Personnel can obtain TE3 and TE4 if they carry out methods relevant to these endorsements on five occasions at Level 1 and pass the relevant examinations.

### 3.5 Limited scope

If personnel do not meet the requirements for the minimum number of sites for the Level 2 competency level (that is having worked on five different sites), it is still possible for them to obtain certification, but the scope would be limited to the specific sites they have worked on. This situation would apply to personnel who carry out in-house monitoring on less than five sites.

### 3.6 Limited technical endorsements for TE3 and TE4

Where personnel with certification limited by site are only required to carry out monitoring of gases or vapours using one monitoring technique it is possible to obtain a Limited Technical Endorsement (LTE) for TE3 and TE4, referred to as LTE3 and LTE4 respectively. An example of a situation where this would apply would be if the candidate carried out determination of speciated volatile organic compounds using extractive sampling onto sorbent tubes only.

When applying for LTE3 or LTE4, the applicant is required to state the monitoring technique that they use, and the site(s) on which it would be used. A description of acceptable monitoring techniques can be found in Technical Guidance Note (Monitoring) M2<sup>4</sup>.

LTEs are assessed by a written paper.

### 3.7 Progression from Level 1 to Level 2

The Level 1 (technician) is able to carry out all aspects of monitoring under the general supervision of a Level 2. As such, personnel may wish to remain at Level 1.

For those personnel who wish to progress to Level 2 it is important to realise that besides knowledge of monitoring standards and guidance notes they must be able to demonstrate competence gained from their experience carrying out monitoring. For Level 2 personnel, who don't have limited scope certification, this experience is best obtained by carrying out monitoring tests at a wide variety of processes and locations.

The MCERTS personnel competency standard specifies that personnel must spend six months at Level 1 and carry out monitoring on 10 occasions before taking their Level 2 examination. These are **minimum** requirements, which may be suitable for personnel applying for limited scope certification. However, for other personnel it is strongly recommended that they spend one to two years at Level 1 before applying for Level 2.

A major part of the Level 2 oral exam is an assessment of the candidates understanding of risk assessments, site reviews, site specific protocols and monitoring reports. It is therefore important that personnel have first hand experience of producing these documents.

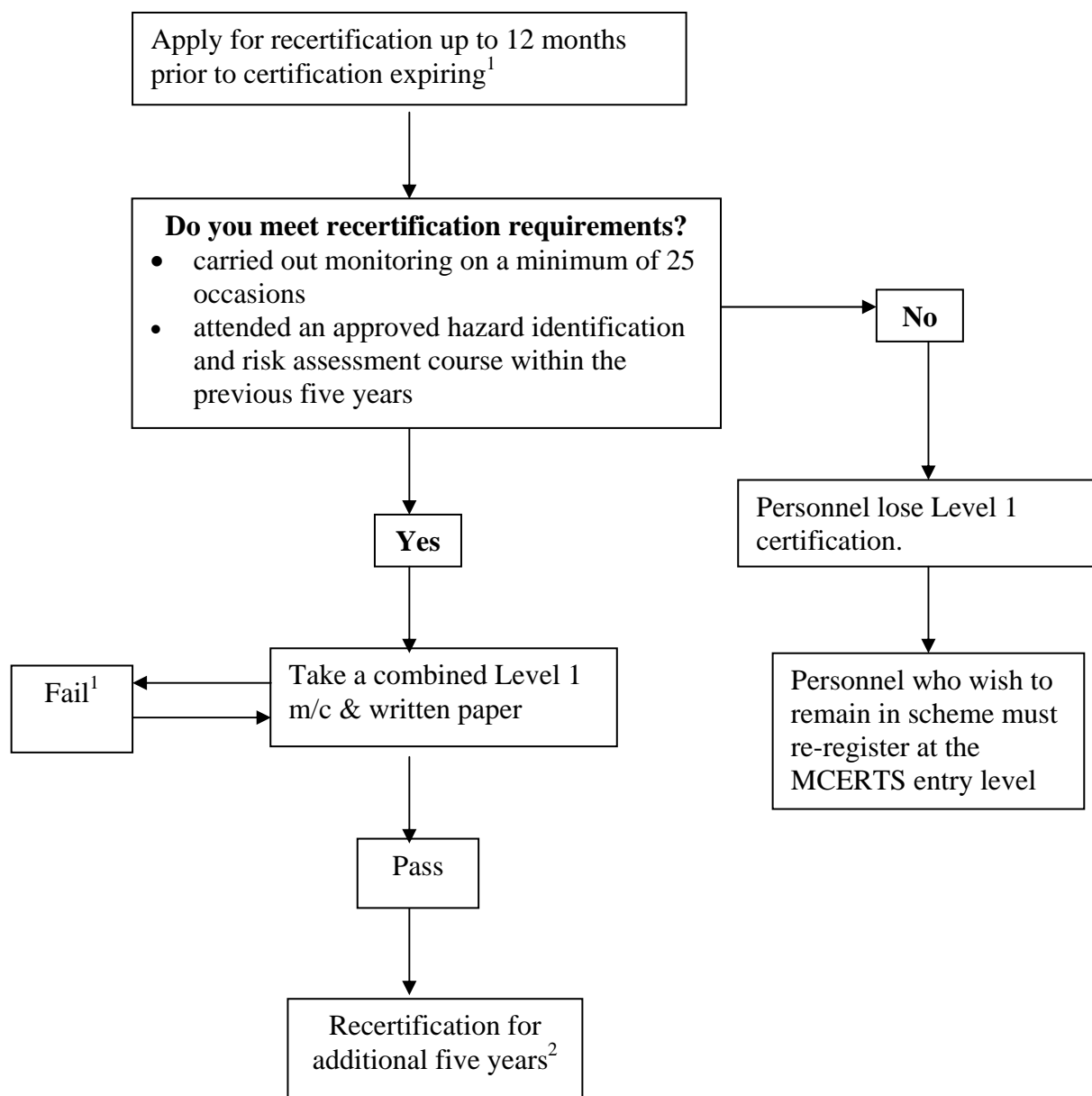
It is also recommended that personnel take one or two technical endorsements before applying for Level 2 certification.

### **3.8 Recertification**

In order to maintain certification, personnel shall undergo reassessment before the end of the five-year certification period. This reassessment shall take account of a person's ongoing experience and confirm that they have retained their technical knowledge, and are aware of any new developments in stack-emission monitoring.

The recertification route for Level 1 is shown in Figure 3. Level 1 recertification requires personnel to meet minimum experience requirements and to pass a single exam consisting of both multiple choice and written questions.

**Figure 3: Level 1 Recertification process**



<sup>1</sup>Level 1 personnel who do not obtain recertification before their certificate expires will lose their certification status. If they wish to return to the scheme they must re-register at the MCERTS entry level.

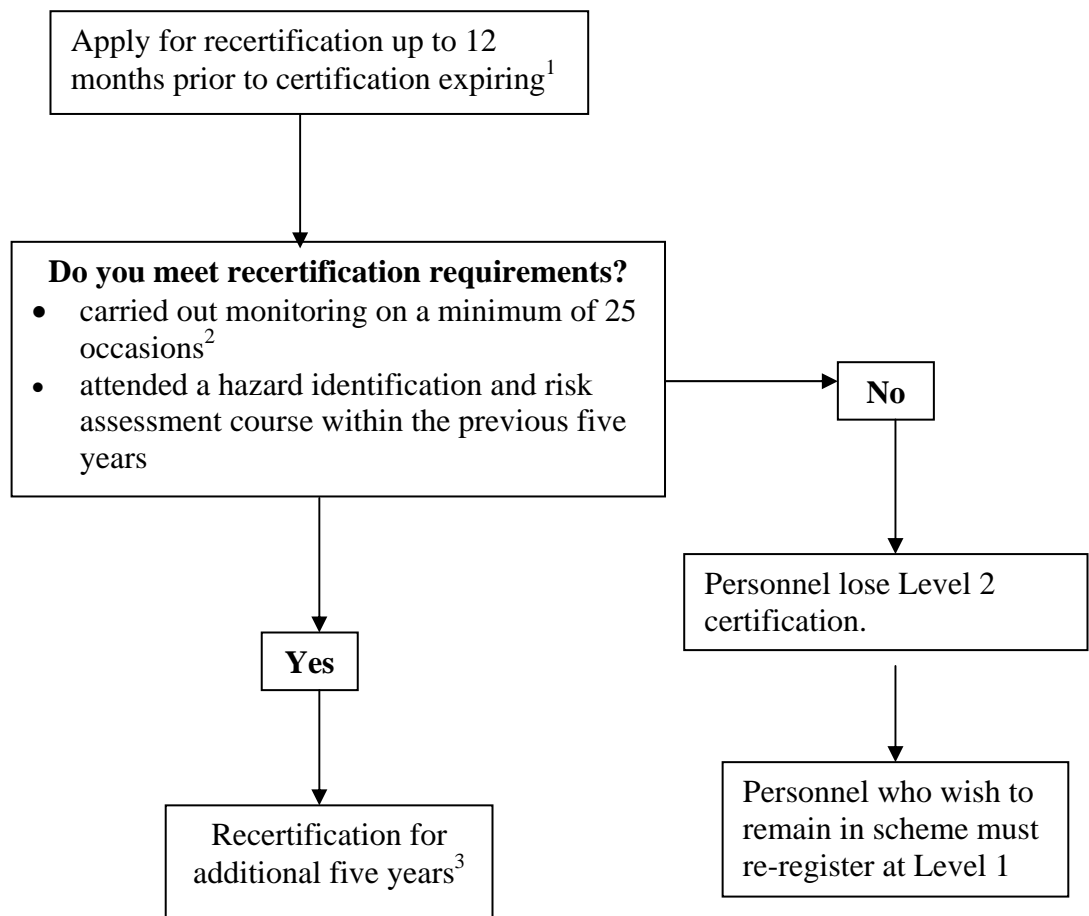
<sup>2</sup>The five years recertification will commence when the previous certification expires.

The recertification route for Level 2 is shown in Figures 4. Level 2 recertification requires personnel to meet minimum experience requirements. They must also maintain at least one technical endorsement in order to keep their Level 2 certification. The procedure for maintaining technical endorsements is shown in Figure 5.

It is very important that candidates apply for recertification in the 12 months prior to their Level 2 certification expiring. If they do not apply within this 12 month time period their certification will expire. If a Level 2 person's certificate expires they will be allowed a further period of two years in which to provide evidence that they meet the minimum experience requirements. If they do not apply in this time and they subsequently wish to re-enter the scheme, they will have to do so at Level 1.

Personnel who are not actively working in stack emissions monitoring at the time their recertification is due, will be able to obtain recertification provided they have met the requirements of Figure 4.

**Figure 4: Level 2 Recertification**

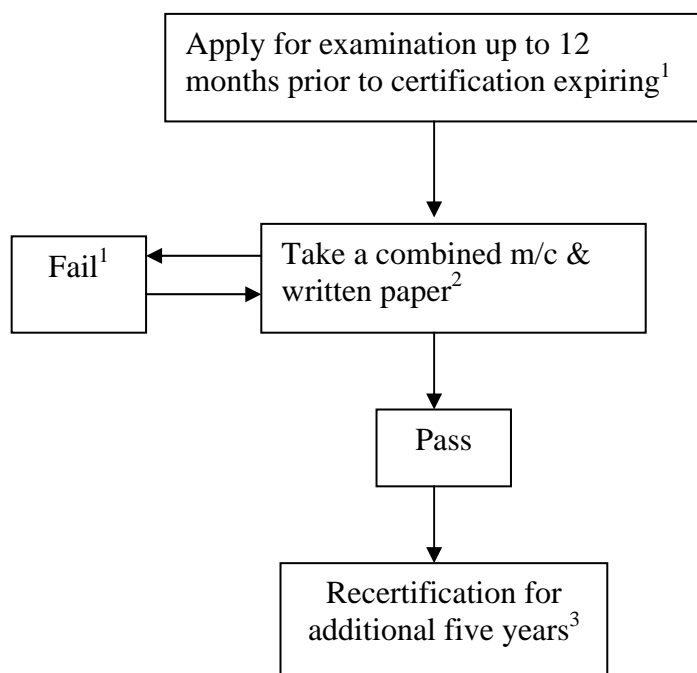


<sup>1</sup>Level 2 personnel do not obtain recertification before their certificate expires will lose their certification status.

<sup>2</sup>For Level 2 personnel who possess limited scope certification, they must carry out monitoring on a minimum of five occasions for each site they wish to include in their certification

<sup>3</sup>The five years recertification will commence when the previous certification expires.

**Figure 5: Maintaining technical endorsements**



<sup>1</sup>Personnel who do not regain their technical endorsements before they expire will lose them from their certificate. If they wish to regain them they must pass both the multiple choice and written paper.

<sup>2</sup>Limited scope candidates with limited technical endorsements take a written paper

<sup>3</sup>If the candidate passes the examination before the certificate expires, the five years recertification will commence when the previous certification expires.

### **3.9 Code of conduct**

To maintain the integrity of the scheme, certified personnel are required to agree to comply with the Code of conduct in Annex 2 of this document. It is important that certified personnel follow this code of conduct whenever they are carrying out manual stack emissions monitoring. Failure to follow it may result in them having their certification suspended or withdrawn.

In particular, personnel should note that they must follow the health and safety principles given in Technical Guidance Note M1, whenever they are carrying out stack emissions monitoring. The principle being, that safe stack emission monitoring working practices apply at all times, not just when carrying out MCERTS accredited work.

## **4. Accreditation of organisations**

### **4.1 Accreditation of organisations to EN ISO/IEC 17025 for the MCERTS performance standard**

To carry out MCERTS accredited work stack-emission monitoring organisations must be accredited to EN ISO/IEC 17025 (General requirements for the competence of testing laboratories) for the MCERTS performance standard for organisations. The MCERTS performance standard specifies requirements that organisations must meet to become MCERTS accredited. It also provides specific interpretations to many of the general requirements of EN ISO/IEC 17025.

### **4.2 Role of UKAS**

The accreditation of organisations is carried out by UKAS, who assess organisations using its standard procedure for assessments to EN ISO/IEC 17025. Organisations must apply to UKAS to be assessed to EN ISO/IEC 17025 for the MCERTS performance standard.

The Environment Agency and UKAS have an agreement detailing how MCERTS accreditation will operate. Part of this addresses the role of UKAS in assessing the health and safety of organisations carrying out stack-emission monitoring. The MCERTS performance standard details requirements on organisations to ensure that they have a health and safety management system and are following safe systems of work (for example, undertaking risk assessments). UKAS will audit whether these systems are in place. If at any stage they observe poor health and safety practice they will inform us. If required we will then inform the Health and Safety Executive.

This agreement also allows us to use information from UKAS audits for regulatory purposes.

### **4.3 Requirements of the MCERTS performance standard for organisations**

#### **4.3.1 Use of certified personnel**

MCERTS accredited organisations must use personnel registered with the personnel certification scheme. The personnel competency standard states three levels of competency – an entry level (trainee), Level 1 (technician) and Level 2 (team leader). Trainees can undertake work under the direct supervision of Level 2 personnel. Level 1 personnel may work as part of a team, led by a Level 2 person. A Level 2 person can lead a stack-emission monitoring team, approve site reviews, risk assessments, site-specific protocols and monitoring reports provided they have the technical endorsements relevant to the substance being measured (see section 3).

#### **4.3.2 Selection of appropriate methods and use of Method Implementation Documents (MIDs)**

Organisations must carry out monitoring in accordance with appropriate standard methods and instructions on their implementation. We supplement standard methods, where required, with MIDs, which provide details on how standard methods are used for regulatory monitoring.

The organisation must produce written technical procedures following the standard methods and the MID, where available. A technical procedure states how a method is performed, provides details of technique, sampling and analysis, as well as instructions on how equipment should be used, how data is to be recorded and results reported.

#### **4.3.3 Site review**

Before stack-emission monitoring work is carried out, a site review is required to understand the physical and logistical situation on-site. The review includes an exchange of information with the operator to provide and obtain relevant information. The performance standard for organisations provides a checklist of points to be considered in the site review.

#### **4.3.4 Risk assessment**

An assessment of the hazards and associated risks involved in stack-emission monitoring shall be undertaken and documented during a site review and before every measurement campaign. The requirements of a risk assessment are detailed in the performance standard for organisations.

#### **4.3.5 Site-specific protocol**

A site-specific protocol or measurement plan describes how an organisation plans to carry out monitoring at a specific location. Prior to carrying out the monitoring the protocol should be submitted to the operator for approval. The minimum factors required in a protocol are detailed in the performance standard for organisations.

#### **4.3.6 Monitoring record sheets**

The organisation must have procedures for recording monitoring data and operations relating to stack-emission monitoring. Monitoring record sheets will be used to record this information. Minimum details required for these are provided in the performance standard for organisations.

#### **4.3.7 Work file**

Organisations must maintain a work file to record the details of a stack measurement campaign. Information that is kept in a work record is provided in the performance standard.

#### **4.3.8 Report format**

Organisations must produce a standard report of results, which contains as a minimum the information specified in the performance standard.

#### **4.4 Application procedure**

UKAS provide information on accreditation at:

[www.ukas.com](http://www.ukas.com)

If you have any questions regarding the accreditation process, or would like further information on how to apply, please contact:

UKAS  
21 – 47 High Street  
Feltham  
Middlesex  
TW13 4UN

Tel: 020 8917 8400

Fax: 020 8917 8500

Email: [info@ukas.com](mailto:info@ukas.com)

## **5. References**

1. MCERTS performance standard for organisations, Environment Agency.
2. MCERTS personnel competency standard, Environment Agency.
3. Technical Guidance Note M2, Monitoring of stack-emissions to air, Environment Agency.
4. Technical Guidance Note M1, Sampling requirements for stack-emissions monitoring, Environment Agency.
5. EN ISO/IEC 17025:2000 General requirements for the competence of testing and calibration laboratories.

## **Annex 1 Example MCERTS personal stack monitoring record sheet**



## Guidelines on how to fill in an MCERTS personal stack monitoring record

Sheet: 1 Name: 2 MCERTS Reg No: 2

No	Date	Site	Installation/Stack	Job Ref	TE1 particulate monitoring	TE2 multi-phase sampling		TE3 gases/vapours manual		TE4 gases/vapours instrumental		Witness	
					level	level	substance	level	Substance	level	substance	name	MCERTS Reg.
3	4	5	6	7	8	8	9	8	9	8	9	10	11

The column headings of the MCERTS personal stack monitoring record are shown below with an explanation of the information required.

- 1 Each sheet used should have a consecutive number (1, 2, 3 etc.)
- 2 Your name and MCERTS Registration No.
- 3 Sequential number given to each stack sampled
- 4 Record the dates(s) the sampling was carried out
- 5 Name of the site where sampling was carried out
- 6 Unique identification of installation/stack and the type of process sampled
- 7 Record the job reference that will allow traceability back through your monitoring records where the full details of the work are maintained
- 8 Use this column to indicate your level of responsibility for the job as follows:
  - Trainee
  - Level 1
  - Level 2
- 9 Indicate which substance was sampled
- 10 Name/signature of a responsible person authorising that the monitoring record is correct. For trainees and Level 1 personnel, this will be an MCERTS Level 2 person
- 11 MCERTS registration No. of the Level 2 person in 10 above

## **Annex 2 Code of conduct**

*I agree to comply with the “MCERTS Personnel competency standard” and “MCERTS Performance standard for organisations”<sup>Note 1</sup>*

Note 1: this applies when personnel are carrying out MCERTS accredited stack emissions monitoring.

*I agree to follow the health and safety principles in “Environment Agency Technical Guidance Note M1”<sup>Note 2</sup>*

Note 2: this applies to all stack emissions monitoring, including unaccredited work. Personnel, who do not follow the health and safety principles in Environment Agency Technical Guidance Note M1 on all occasions, may have their certification suspended or withdrawn by Sira.

*I agree to comply with the “Regulations Applicable to Holders of Sira Certificates”*

*I agree to only make claims regarding the scope and status of my MCERTS certification in accordance with the scope for which certification has been awarded.*

*I agree not to use my certification in a misleading manner.*

*I agree not to use my MCERTS certification in such a manner as to bring Sira or the Environment Agency into disrepute.*

*I agree not to make any misleading or unauthorised statement regarding my MCERTS certification.*

*Upon suspension or withdrawal of my MCERTS certification, I agree to immediately discontinue any claim to hold certification and to return all certificates and identification cards to Sira.*