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# Best Practice Manual

for the Implementation of a Quality  
Management System and Accreditation Model for  
Crime Scene Investigation

**ENFSI-SOC-BPM-02**

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## ENFSI's position on Best Practice Manuals

ENFSI wishes to promote the improvement of mutual trust by encouraging forensic harmonization through the development and use of Best Practice Manuals. Furthermore, ENFSI encourages sharing Best Practice Manuals with the whole Forensic Science Community which also includes non ENFSI Members.

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**BEST PRACTICE MANUAL FOR THE IMPLEMENTATION OF  
A QUALITY MANAGEMENT SYSTEM AND ACCREDITATION  
MODEL FOR CRIME SCENE INVESTIGATION**

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## 1. AIMS

This manual is intended to provide guidance for implementation of a standardized quality management system (QMS) for crime scene investigation (CSI) activities as well as for preparing and achieving accreditation of the process of CSI to ISO/IEC 17020 *Conformity assessment - Requirements for the operation of various types of bodies performing inspection (ISO/IEC 17020:2012)*.

## 2. SCOPE

This manual describes how to develop and maintain a QMS for CSI process in accordance with ISO/IEC 17020. It also provides the information about the accreditation process.

The manual includes the references to international guidelines and policy documents on the application of ISO/IEC 17020 to CSI (ILAC G19) and inspection activities (ILAC P15). The manual also takes into consideration the guidance from national accreditation bodies such as UKAS and ANAB. The ENFSI Best Practice Manual for Scene of Crime Examinations (ENFSI-BPM-SOC-01) and other ENFSI guidance documents have played an important role in the development of this manual.

The manual encompasses also the following:

- information on the role and the differences between the accreditation standards and the field specific standards;
- useful documents and recommendations to be used in the development of a QMS for CSI;
- guidance on developing a QMS documentation.

This manual provides practical guidance on the resource, process and management system requirements of ISO/IEC 17020. The manual does not cover guidance on structural requirements such as administrative and organisational requirements. The QMS procedures should consider the national law enforcement framework and the legal systems in which the CSI units operate.

## 3. TERMS AND DEFINITIONS

In this document, the terms and definitions given in ENFSI documents, ILAC G19 and ILAC P15, standards such as ISO 9000, ISO/IEC 17000, ISO/IEC 17020 and ISO/IEC 17025 apply. The glossary is given in Appendix A.

## 4. STANDARDS AND GUIDELINES

### 4.1 Role of ISO/IEC 17020, ISO/IEC 17025 and ISO 9001

The main international standards to be considered for developing a quality management system for crime scene investigation are ISO/IEC 17020, ISO/IEC 17025 and ISO 9001. There are differences between the standards, which need to be taken into account in the purpose for which the standard is used. It needs to be emphasised that the overarching aim of the standard is to describe "what" should be achieved, not "how" or "who", which means that the concrete prescription is avoided.

The standard ISO/IEC 17020 *Conformity assessment - Requirements for the operation of various types of bodies performing inspections* contains requirements for the competence of bodies performing inspection and for the impartiality and consistency of their inspection activities.

Inspections can be based on professional judgement. The standard covers the activities of inspection bodies whose work can include the examination of materials, products, installations, plants, processes, work procedures or services, and the determination of their conformity with requirements and the subsequent reporting of results of these activities to clients and, when required, to authorities. The standard can be used as a requirements document for accreditation.

The standard ISO/IEC 17025 *General requirements for the competence of testing and calibration laboratories* specifies the general requirements for the competence, impartiality and consistent operation of laboratories. The standard can be used as a requirements document for accreditation.

Requirements of ISO/IEC 17020 and ISO/IEC 17025 are very similar when applied to forensic process. The main difference between the standards is that ISO/IEC 17020 includes professional judgement. Where measurements are performed as part of inspection, consideration of the requirements of ISO/IEC 17025 can be required. In Europe, ISO/IEC 17020 standard has been used for accreditation of crime scene investigation activities. In addition, some European national accreditation bodies use ISO/IEC 17020 to assess the interpretation of results of comparative laboratory examinations. National accreditation bodies can choose, as appropriate, to have accreditation programs based on ISO/IEC 17025 and/or ISO/IEC 17020 for different parts of the forensic science process.

The standard ISO 9001 *Quality Management Systems - Requirements* specifies requirements for a QMS and focuses on the effectiveness of the QMS in meeting customer requirements. In addition, the standard ISO 9001 contains useful information of quality management principles. This standard is applicable to all organisations and serves as a certification standard. The standard does not cover technical competence requirements and certification against it does not itself demonstrate the competence of an organisation to produce technically valid data and results. The standard is not an accreditation standard. Annex B of ISO 9001 contains information on other international standards on quality management and quality management systems that may be helpful.

#### 4.2 Role of ISO 21043

The ISO 21043 *Forensic Sciences* series of standards is under development and, when complete, will cover the different aspects of the forensic process from crime scene to court. The series consists of five parts, covering such topics as the collection of evidence at the crime scene, analysing and interpreting evidence, and reporting of results and findings. ISO 21043-2:2018 *Forensic Sciences - Part 2: Recognition, recording, collecting, transport and storage of items* applies throughout the forensic process, both in the field and in the facility. ISO 21043 is considered to be complimentary to ISO/IEC 17020 and ISO/IEC 17025 and is therefore not an accreditation standard as such.

#### 4.3 Role of guidelines and ENFSI Best Practice Manuals

The purpose of existing guidelines is to provide recommendations on how the requirements of the standards to a QMS in different fields of expertise should be applied. International Laboratory Accreditation Cooperation (ILAC) has published a document ILAC G19: *Modules in a Forensic Science Process* that provides a set of guidelines for laboratories, scene of crime investigation units and other entities for the application of ISO/IEC 17020 and ISO/IEC 17025.

In addition, the policy document ILAC P15 *Application of ISO/IEC 17020:2012 for the Accreditation of Inspection Bodies*, is intended to be used by accreditation bodies assessing inspection bodies for accreditation as well as by inspection bodies seeking to manage their operations in a manner fulfilling the requirements for accreditation.

Some of the national accreditation bodies have published guidance documents on the application of ISO/IEC 17020 for forensic inspections bodies, for example, the national accreditation bodies UKAS in the United Kingdom and ANAB in North America. The publications UKAS RG 201 *Accreditation of Bodies Carrying out Scene of Crime Examination* and ANAB *ISO/IEC 17020 Accreditation requirements for Forensic Inspection Bodies, MA 3012*, provide national guidance on the application of certain clauses of ISO/IEC 17020.

The ENFSI Best Practice Manual for Scene of Crime Examination (ENFSI-BPM-SOC-01) aims to provide a framework for procedures, quality principles, training processes and approaches to the forensic examination of scenes of incidents. ENFSI-BPM-SOC-01 can be used to establish and maintain working practices for CSI in order to produce reliable results, optimise the quality of the information obtained and produce robust evidence.

## **5. GUIDANCE TO QUALITY MANAGEMENT SYSTEM**

A QMS is a tool that enables an organisation to demonstrate its ability to consistently deliver services that meet the requirements of customers and applicable laws and regulations. It enables an organisation to increase customer satisfaction and improve communication.

A QMS is a set of policies, processes and procedures required for planning and implementing activities that can affect a forensic service provider's ability to meet customer requirements. A QMS contains elements such as administrative aspects, resources, working processes as well as procedures to ensure activities are conducted and performed in an efficient and reliable way. A QMS provides elements for continuous improvement and valuable information for the use of top management.

Forensic service providers of the ENFSI have recognized the value and benefits of a QMS for CSI and identified benefits as follows:

- ensures the validity of evidence and has an impact on the whole forensic process;
- harmonises working practices;
- ensures staff competence;
- provides continuous improvement.

### **5.1 Process of planning and implementing of a QMS for CSI**

A forensic service provider should have clear political orientation and strategic decision for implementing a QMS for CSI, in order to meet the work with success. Setting up a standards-based QMS for CSI needs resources, support and commitment from the top management of a police organisation. There would be a need to incorporate a QMS for CSI into a national police strategy. In the planning and implementation of a QMS, it would be beneficial to utilize project management tools.

In preliminary planning phase for setting up a QMS for CSI, the following aspects should be considered:

- how CSI and forensic examinations are organised in the country;
- would a QMS for CSI be a basement for a national QMS of other forensic units having same tasks and responsibilities (a comprehensive QMS) or would it concern only a specific police organisation (an isolated solution);
- what a forensic service provider would like to achieve and in what timeframe;
- would it be a national project or a specific police organisations' project;



- how phasing a project or divide into subprojects;
- what kind of expertise would be needed in a project;
- how to setup a steering group and project group;
- what would be the target of a project;
- who/which party would be the owner of a project;
- how much resources (man-days, staff costs, travel costs) would be needed for a project;
- what would be the total costs of a project and who would be responsible for the costs;
- would there be a funding available for a project;
- discussions with a national accreditation body (NAB) already in the planning phase (e.g. which standard (ISO/IEC 17020 and/or ISO/IEC 17025) a NAB intends to use for which parts of the forensic science process applying for accreditation, specific requirements and advice for which party would apply for accreditation).

In this context, it should be stressed that a QMS and accreditation are related, but they are two different things. As a first step, a forensic service provider should develop and implement a standards-based QMS for CSI. At this stage, the organization can decide on its objective to apply for accreditation at a later stage when a QMS is ready for external assessment. On the other hand, a forensic service provider may decide to apply for accreditation at any time once it has gained experience and confidence in the performance of its QMS.

A forensic service provider can have one single management system to cover all of its activities and all the competence standards to it works. The standard ISO/IEC 17020 specifies that inspection activities can overlap with testing activities where these activities have common characteristics. However, an important difference is that many types of inspection involve professional judgement to determine acceptability against general requirements, for which reason the inspection body needs the necessary competence to perform the task.

## 5.2 Customers and stakeholders

It is essential to identify the organisations customers and stakeholders, in order to best tailor the services to be provided to the needs of the customers or to support investigations in all types of criminal matters.

A stakeholder is a person or organisation that can influence, be influenced by, or perceive as influenced by a decision or activity. Stakeholders can be divided in different groups as; customers, employees, suppliers, communities, governments.

The police customers can be the public or the community, while the customers of a forensic science provider, can be the receiver of a forensic report, e.g. the investigation management. A customer is also one of an organisation's stakeholders.

ISO 9001 places great emphasis on the relationship with customers and other stakeholders.

In ISO/IEC 17020, requirements have been set for customers and stakeholders, and they are mainly described in these chapters:

- 4.2 Confidentiality;
- 6.2.11a Selection and approval of suppliers;
- 6.3 Subcontracting;
- 7.5 Complaints and appeals;
- 7.6 Process for complaints and appeals.

A forensic service provider should establish an overview of important stakeholders that can influence on its activities positively or negatively. Knowledge of customers 'needs and others' interests in the organization can be used in several ways:

- contribute to the development of forensic investigations and ensure that the service and forensic reports are satisfactory;
- ensure that the service that has been requested are delivered;
- prevent negative influences from external conditions, e.g. if a strike is planned at a supplier, try to increase the stock of an item, to avoid having to stop own work.

*Stakeholder analysis* is a method that is recommended as a tool for analysis of customers and stakeholders.

A stakeholder analysis usually consists of 4 steps:

- 1) Identify customers/stakeholders: usually persons/organisation related to the criminal process such as police investigation services, judiciary (prosecutor, judge), society in general.
- 2) Map the needs of the different customers and stakeholders: elicit interests and expectations through e.g. interviews, surveys, feedback, etc. and compare with needs within the organisation and services offered.
- 3) Prioritize them: considering the influences and interests of different stakeholders and prioritising the impact on the services to be provided by the organisation.
- 4) Establish communication plan: based on the mapping and prioritization of the stakeholders, a communication plan should be established. The plan may, for example, include number and topic of meetings with and surveys of key stakeholders.

### 5.3 Impartiality and independence

Impartiality and independence of a forensic service provider are essential basis to a criminal justice system. Requirements for impartiality and independence are self-evident principles to police organisations and are generally defined in national legislation or codes of conduct. However, a forensic service provider should consider how to fulfil impartiality and independence requirements of ISO/IEC 17020 for CSI. Forensic examinations may be subject to factors, such as cognitive bias, which may affect impartiality and thus compromise the evidential value of investigation. It is important that a forensic service provider is able to address and demonstrate impartiality and independence of CSI activities to police management and to stakeholders such as justice system and national accreditation body.

A forensic service provider shall be independent to the extent that is required with regard to the conditions under which it performs its services. The standard ISO/IEC 17020 classifies inspection bodies as type A, B, or C depending on the degree of independence of the inspection body from its customer. Annex A of ISO/IEC 17020 contains the independence requirements for inspection bodies (type A, B, C). A forensic service provider shall meet the minimum requirements for a given category (type A, B or C) in accordance with Annex A. Although ISO/IEC 17020 contains different independent requirements, all types of operators comply with the standard as a whole, so the requirements for competence and impartiality are the same regardless of the type classified. The type of independence is not determined solely by to whom an inspection body provides services. It is important to emphasize that type A does not provide services to anyone other than an external party (third party) and shall be fully independent.

A forensic service provider should describe, through organisational charts or other means, any of its relationships or its staff relationships that could affect its impartiality, to the extent necessary.

Demonstrating independence is particularly important where the crime scene unit is in the same organisation as the investigative unit.

A forensic service provider shall have written policies and procedures that it carries out CSI activities in an impartial way and commercial, financial and other pressures do not compromise its impartiality. Procedures shall also include how risks to impartiality are identified on an ongoing basis and a forensic service provider shall be able to demonstrate how identified risks are eliminated or minimized. The standard ISO/IEC 17020 requires top management's commitment to impartiality.

The leading role and commitment of top management in the process of defining policies and procedures for impartiality and independence is essential. The top management could make relevant statements and policies publicly available as well as support education and training of impartiality and cognitive bias. Such measures would be favourable to demonstrate the commitment of the top management to impartiality.

The requirement to act impartially may be included in a Code of Conduct. A code of conduct could include work ethics, confidentiality, impartiality, personal safety, relationships with other members of the forensic unit, and any other issues needed to ensure appropriate conduct of forensic unit staff. The ENFSI has published a Code of Conduct (BRD-GEN-003), which contains the information on duties and responsibilities of its forensic practitioners.

All personnel working for a forensic service provider should be aware of the responsibility to act impartially and appropriate training on impartiality should be provided to personnel. Personnel may be exposed to external and internal threats to impartiality. Policies and procedures of a forensic service provider should support personnel to identify such threats or inducements that could affect their impartiality. Procedures should provide guidance on how to declare and record conflicts of interests identified by personnel.

In addition, it would be good to consider that pressure may have an impact on judgement of a staff member. It is essential to be aware of a potential impact of cognitive bias in different phases of a crime scene examination where many processes require subjective evaluations and interpretations as pointed out in ENFSI-BPM-SOC-01 [20]. In case a staff member would work also for another company, a forensic service provider should consider procedures on evaluating whether any risks are involved.

A forensic service provider should identify potential risks to impartiality of crime scene investigation on an ongoing basis and take appropriate measures to eliminate or minimize them. The potential risks may relate to the organisation's activities or its relationships or those of its personnel. They can include, for example, the use of external resources and subcontracting. Records of a QMS may contain valuable information to be used in identification of potential risks to impartiality.

A forensic service provider should have procedures in place to identify risks for impartiality whenever they occur and need for corrective action. In addition, procedures should include the necessary checks to maintain the impartiality of CSI, for example, by performing regular reviews on casework.

Records should be kept of "an impartiality risk analysis" and "control measures". Annex 1 of ILAC P15, provides an example of a template for documenting a risk analysis for impartiality. However, a forensic service provider may use any risk analysis tools it considers beneficial, see Section 5.9.2 Risk assessment.

Sources and references:

ISO/IEC 17020: 4.1; 6.1.12; Annex A  
ILAC P15: 4.1.3 n1, 4.1.3 n2, 4.1.3 n3, 4.1.4 n1, 4.1.5 n1, 4.1.5 n2, 4.1.6 n1, 6.1.12 n1, Annex A, Annex1, Annex 2  
ILAC G19: 3.4  
ENFSI Code of Conduct (BRD-GEN-003)  
ENFSI-BPM-SOC-01: 9.3.2

## 5.4 Personnel

Human resources are considered the most important asset of an organisation. A forensic service provider shall have a sufficient number of qualified personnel to conduct CSIs, including the ability to make professional judgements. Requirements of the standard [1] emphasize that the persons involved in CSI activities are qualified for their assigned tasks and are aware of their duties, responsibilities and authorities. The standard addresses that a forensic service provider shall have documented procedures for selection, training, formal authorization/approval and monitoring crime scene investigators and other personnel involved in CSI activities. The defined policies and procedures should cover how a forensic service provider ensures and demonstrates by objective evidence the competence of personnel to perform the required work.

Sources and references:

ISO/IEC 17020: 6.1.2, 6.1.4, 6.1.5  
ILAC G19: 3.3  
ENFSI-BPM-SOC-01: 4.1.1  
ENFSI QCC-CAP-006

### 5.4.1 Competence requirements

A forensic service provider shall define competence requirements for all personnel involved in CSI activities to fulfil the requirements of the standard. All the requirements apply equally for both employed and contracted persons. When determining competence requirements, consideration should be given not only to the persons conducting CSI, but also to other persons who might have an impact on the management, performance, recording or reporting of crime scene examinations. Regulators or specified customers may have identified some aspects of competence requirements that should be included in the generic competence requirements. However, a forensic service provider remains responsible for the appropriateness of competence requirements and their compliance with the requirements of ISO/IEC 17020.

The QMS should include competence requirements for the task assigned to each role, such as:

- education, training, technical knowledge, skills, experience. Relevant technical knowledge means an understanding of the technology behind the crime (e.g. firearms) and the technology used to investigate the crime (e.g. fingerprints, blood pattern analysis);
- ability to make professional judgements to determine conformity;
- knowledge of management system and ability to implement administrative as well as technical procedures applicable to the activities performed;

The competence of any staff member in his or her role in the context of the forensic service provider's specific infrastructure is assessed and assured through suitable tools that are in accordance with international standards and recognised by each country's National Accreditation Body.

Sources and references:

ISO/IEC 17020: 6.1.1  
ISO 9001: 7.2, 7.3  
ILAC P15: 5.2.7 n1, 6.1.1 n1, 6.1.1 n3, 6.1.2 n1  
ILAC G19: 3.3  
ENFSI-BPM-SOC-01: 4.1.2  
ENFSI QCC-CAP-003

UKAS RG 201: 6.1.1  
ANAB MA 3012: 7.14.4, 7.14.5

#### 5.4.2 Introduction of new personnel

A forensic service provider should have defined procedures on how to train and supervise a new staff member during introduction. The individual training programme should consider a trainee's initial expertise, specific knowledge and experience. Initial competence can be assessed based on defined criteria through interviews and practical and theoretical tests. The experts responsible for a trainee's induction should regularly monitor the progress of the training.

A forensic service provider should be able to demonstrate how a trainee has participated in CSI under the guidance of experienced crime scene examiners.

The trainee's competence should be assessed against the defined competence requirements or standards before being recognized as competent and authorized to carry out CSI in the field concerned.

The procedure for the formal authorization of a trainee should specify that the relevant details are recorded such as how the trainee has been assessed as competent, the inspection activity authorized, the person who authorized it and the date of authorization. The records should contain information on the basis of which authorization was granted.

Sources and references:

ISO/IEC 17020: 6.1.6  
ILAC P15: 6.1.5 n1, 6.1.6 n1, 6.1.10 n1  
ILAC G19: 3.3  
ENFSI-BPM-SOC-01: 4.1.5  
UKAS RG 201: 6.1.2

#### 5.4.3 Maintenance of competence

A forensic service provider shall have procedures for the on-going training and maintenance of competence, skills and expertise as well as procedures for retraining. Procedures should include also training to keep pace with the latest developments in technology and inspection methods related to CSI. Retraining or re-introduction may be necessary, for example, when a staff member have been involved in other duties or has been absent for a longer period of time e.g. a year.

Identification of training needs for each person should take place at regular intervals. The review of training needs should result in documented plans for further training or a statement that no further training is required for the individual. Where necessary, training programs should also include training in the presentation of evidence in court.

A forensic service provider should be able to demonstrate how it maintains on-going competence of personnel. In principle, crime scene examiners should be carrying out CSI on a regular basis. Evidence to maintain competence should reflect recent work and actual knowledge.

Sources and references:

ISO/IEC 17020: 6.1.6, 6.1.7  
ILAC P15: 6.1.7 n1, 6.1.9 n1  
ILAG G19: 3.3  
ENFSI-BPM-SOC-01: 4.1.6  
UKAS RG 201: 6.1.3  
ANAB MA 3012: 7.14.7

#### 5.4.4 Monitoring of competence

A forensic service provider shall have sufficient evidence that the personnel involved in crime scene activities is continuing to perform competently. The management needs to demonstrate that the personnel are competent by carrying out assessment of their knowledge and skills against defined criteria.

According to ILAC P15, the major aim of the monitoring requirement is to provide the inspection body with a tool to ensure the consistency and reliability of inspection outcomes, including any professional judgements against general criteria. Monitoring may result in the identification of needs for individual training or needs for review of the inspection body's quality management.

The monitoring can include a combination of techniques such as report reviews, interviews, simulated inspections, on-site observations and other techniques to assess performance.

A forensic service provider should have an effective program for on-site observation of crime scene examiners to ensure that the persons working in the organisation have the competence required. On-site observations should be carried out suitably by trained staff that is familiar with the inspection methods and procedures and sufficiently independent to carry out the witnessed activity objectively. Witnessing should not cover only the procedural part of the work but also go into depth of the technical competence of the staff and their ability to take relevant decisions at the scene of crime.

According to ILAC P15, when considering the frequency of on-site observations (on-site witnessing), the following should be considering:

- the risks and complexities of the inspections;
- results of previous monitoring activities;
- technical, procedural or legislative developments relevant to the inspections.

ILAC P15 specifies that on-site observations should be carried out at least once during the accreditation re-assessment cycle. If the levels of risks or complexities, or the results from previous observations, so indicate, or if technical, procedural or legislative changes have occurred, then a higher frequency should be considered. Depending on the fields, types and ranges of CSI covered by inspector's authorization there might be more than one observation per inspector necessary to adequately cover the whole range of required competencies. In addition, more frequent on-site observations may be necessary if there is lack of evidence of continuing satisfactory performance.

Furthermore, ILAC G19 specifies factors to be considered when deciding on the approach to be taken to witnessing include, but are not limited to:

- the degree of complexity of a particular scene in order to confirm competence;
- frequency of attendance at different scenes;
- scope of accreditation;
- experience of the personnel;
- frequency at which a suitable scene appears, for example, terrorist incidents. Scenes which are infrequently encountered may require other means by which to confirm competence, e.g. mock incident or other types of simulations;
- other activities which take place for the purpose of confirming competence.

Sources and references:

ISO/IEC 17020: 6.1.8

ILAC P15: 6.1.8 n1, 6.1.9 n1, 6.1.9 n2

ILAC G19: 3.3, 3.8

ENFSI-BPM-SOC-01: 4.1.5

UKAS RG 201: 6.1.5, 6.1.6  
ANAB MA 3012: 7.14.3

### 5.4.5 Competence records

The purpose of the records is to provide evidence of how a forensic service provider has implemented and ensured the competence of its staff. All members of the forensic staff whose work influences the results of the CSI shall have an up-to-date record that includes relevant training such as external and internal courses attended, authorization, development and competence evaluation.

In addition, these records shall include academic and professional qualifications as well as introduction or retraining received while working for a forensic service provider. Competence records shall be sufficiently detailed to show that each member of staff has been properly trained and that their competence to perform a task has been formally assessed. A forensic service provider should keep records of a trainee's introduction and be able to demonstrate how a trainee's competence was assessed before authorization.

The competence of personnel should be documented so that their competence to conduct CSI at different types of scenes (major/volume crime) or to collect different type of evidence (e.g. fingerprints, fibres, blood pattern analysis) are demonstrated. When appropriate, different types of incidents (e.g. burglary, murder) should be considered.

#### Sources and references:

ISO/IEC 17020: 6.1.10  
ILAC G19: 3.3  
ENFSI-BPM-SOC-01: 4.1.6  
ANAB MA 3012: 7.14.1, 7.14.2

## 5.5 Facilities

A forensic service provider shall have suitable and adequate facilities to be able to perform CSI activities in a competent and safe manner. In the context of CSI the term facilities are considered not only a physical location and/or a mobile office of a forensic service provider but also environment where the integrity of the evidence and the equipment used can be protected during the investigation.

The following basic areas are regarded as facilities and should be available at the crime scene:

- material storage area (e.g. equipment, consumables, reagents, forensic kits);
- dressing area;
- evidence area;
- dedicated areas (e.g. for vehicle examination);
- waste area.

A forensic service provider should have written procedures on ensuring the security any facilities in an appropriate way. There should be effective separation between the areas where incompatible activities are performed. Actions should be taken to prevent cross-contamination. Monitoring the efficiency of cleaning performed should be carried out by specified intervals e.g. in physical location/mobile office, when necessary.

In terms of securing the evidence and preventing cross-contamination the access to the crime scene should be controlled and only be accessible to authorized personnel. It should be considered that unauthorized personnel would not have access to equipment, consumables, items and records.

All staff arriving on site shall be recorded, as the marking of names applies to both authorised staff and visitors.

The environmental conditions at the crime scene may have an effect on deterioration of exhibits. The crime scene should be protected from environmental effects by using appropriate equipment such as tents and cover sheets. When significant environmental conditions are not possible to control, e.g. weather conditions at a scene of crime, the actual conditions shall be recorded.

The storage of exhibits should be secured in order to ensure the integrity and identity of evidence. The access to the storage of exhibits should be controlled and only accessible for authorized personnel. The storage conditions shall be such as to prevent loss, deterioration/degradation and contamination. Any degradation of perishable exhibits should be minimized by storing them in the freezer or fridge as specified in the procedures by a forensic service provider.

Access to a forensic service provider's operational area shall be controlled and limited. Visitors shall not have unrestricted access and records should be kept of all visitors to the operational areas.

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Sources and references:

ISO/IEC 17020: 6.2.1, 6.1.2, 6.2.3

ILAC G19: 3.11

ENFSI-BPM-SOC-01: 4.4

UKAS RG 201: 6.2.1

ANAB MA 3012: 7.15.1, 7.15.2, 7.15.3, 7.15.4, 7.15.5, 7.15.23

## 5.6 Equipment

### 5.6.1 Fit for purpose equipment

Forensic service providers have different assigned tasks, responsibilities and activities to be performed in CSI. It is essential that a forensic service provider have suitable and adequate equipment in order to carry out assigned CSI activities competently and safely. A forensic service provider should consider the suitability and the adequacy of their equipment related to their assigned tasks. Preferable equipment for CSI activities is specified in ENFSI BPM-SOC-01 [20].

A forensic service provider does not necessarily have to be the owner of the equipment. For example, it can borrow, rent, lease or hire equipment, depending on regulations in place. In any case however, a forensic service provider is responsible for ensuring the suitability and calibration status of the equipment used for CSI. Procedures for the use of borrowed (etc.) equipment should be documented and the use of equipment should be recorded in case files.

If any equipment has been removed from a forensic service provider's direct control, the provider shall verify if the equipment meets all relevant requirements before use. Procedures should cover verification of such equipment and verification should be recorded. Verification can be performed by visual inspection, functional checks and/or re-calibration.

A forensic service provider should ensure that the staff has the requested competence to use the equipment. In case of e.g. designated equipment, only specified staff members might have the requested competence to use it. Therefore, it would be essential that a forensic service provider have procedures for the permission to use equipment in a QMS. As part of a training program, a forensic service provider should familiarise and authorise new personnel to use special equipment. A forensic service provider should keep records accordingly.



New equipment having influence on the results of CSI should be verified/validated before taken in use and have documentation on the suitability of new equipment for intended use in records.

Sources and references:

ISO/IEC 17020: 6.2.1, 6.2.2, 6.2.3

ILAC G19: 3.12.2

ENFSI-BPM-SOC-01: 4.2

ANAB MA 3012: 7.15.3, 7.15.8, 7.15.9, 7.17.11

## 5.6.2 Labelling of equipment

There is an extensive diversity of equipment in use for CSI. It is known that equipment may have an effect on the quality of the investigation/inspection results. Therefore, a forensic service provider should consider and define all equipment that has a significant influence on the results of CSI. It is essential to identify such equipment uniquely. The unique identification of equipment can be made by labelling the item or in other ways. Unique identification is important even when a forensic service provider has only one item available in order to enable tracking when items are replaced.

Furthermore, a forensic service provider shall label or otherwise make identifiable equipment where calibration is required, in order for the user to identify the status of calibration or period of validity.

Sources and references:

ISO/IEC 17020: 6.2.4

ISO/IEC 17025: 6.4.8

ILAC P15: 6.2.4 n2

ILAC G19: 3.12.2

ANAB MA 3012: 7.15.7

## 5.6.3 Equipment records

Equipment records play an important role as being tools for maintaining a QMS and for demonstrating that the equipment items are managed according to the set procedures and fulfilment of ISO/IEC 17020. The information of equipment records can be utilized e.g. in risk assessments, internal and external audits and management reviews. The records include also important information for the purposes of the inventory of equipment and the purchase of new equipment.

A forensic service provider should have records on each item of equipment and its software significant to examinations/inspection activities. It is expected that the records held by all forensic units would be in accordance with the requirements specified in ISO/IEC 17025: 6.4.13 [2]. A forensic service provider should consider the following information to be included into equipment records:

- identity of equipment and its software: name, model, serial number, manufacturer, date of acquisition, software details;
- the current location;
- evidence of checks (verification) to document that equipment conforms with specified requirements;
- evidence of commissioning;
- boundaries or limitations of equipment in operational use;
- maintenance plans and maintenance carried out to date, where relevant to the performance of the equipment;
- evidence of functional checks (performance checks) to indicate compliance with specifications;
- details of damages, malfunctions, breakdowns, modifications and repairs;
- date placed in service and service reports;

- calibration dates, calibration results/certificates, adjustments, acceptance criteria, the due date of next calibration or the calibration interval;
- evidence of in-service checks between recalibrations, where relevant to the performance of the equipment (acceptance criteria for approval of these checks);
- removal of defective equipment from casework;
- documentation of reference materials (results, acceptance criteria), relevant dates and the period of validity;
- evidence of software performance periodical checks.

Other issues to be considered in relation to equipment records:

- inventories of equipment in possession of forensic service provider and responsible staff;
- evidence of evaluation of the suppliers of equipment (see Section 5.6.7);
- evidence of monitoring the effectiveness of cleaning performed (see Section 5.6.4.2.2).

Sources and references:

ISO/IEC 17020: 6.2.15

ISO/IEC 17025: 6.4.13

ILAC G19: 3.12.3

ENFSI-BPM-SOC-01: 7.4, 7.5

ANAB MA 3012: 7.15.22

## 5.6.4 Calibration, maintenance and operational use of equipment

In this section the requirements of ISO/IEC 17020 regarding calibration, maintenance and operational usage of equipment and provided practical guidance are highlighted accordingly. In order to ensure the measurement equipment is working properly, a forensic service provider should consider all aspects that have an effect of the outcome of measurements (e.g. calibration, correct use, service, cleaning of measurement equipment including functional checks).

Sources and references:

ISO/IEC 17020: 6.2.3-6.2.7, 6.2.9, 6.2.14

ILAC P15: 6.2.3 n2, 6.2.4 n1, 6.2.6 n1, 6.2.6 n2, 6.2.7 n1, 6.2.7 n2, 6.2.9 n1

ILAC G19: 3.12, 4.4.5

ANAB MA 3012: 7.5.10, 7.15.12, 7.15.13, 7.15.14, 7.15.18

### 5.6.4.1 Calibration

Metrological traceability is a key principle in the calibration of measurement equipment. Metrological traceability means that the calibration is traceable to SI unit of measurement. For measurements performed in an accredited activity, the ILAC P10 *Policy on Metrological Traceability of Measurement Results* [13] is a mandatory guideline. It describes how traceability in accredited activities should be ensured and how it should be always followed.

A forensic service provider shall determine and record decisions on which measurement equipment used in CSI has a significant influence on the results and interpretation of the forensic results. Such measurement equipment should therefore traceably calibrate whenever technically possible. ILAC P10 describes alternative metrological traceability chains for SI units when it is not possible to trace measurement results to those units.

The relevant calibration intervals for measurement equipment should be specified in an established calibration program. When determining the calibration interval, the manufacture's recommendation can be considered and/or use information from guidance documents such as ILAC G24 *Guidelines for the determination of recalibration intervals of measuring equipment* [16], NATA *Specific*

*Accreditation Guidance - Calibration Reference Equipment [27], Eurachem/CITAC Guide to Quality in Analytical Chemistry [28].*

In order to ensure the metrological traceability of the calibration, measurement equipment to be calibrated would be appropriate and cost effective performed by a NAB accredited calibration laboratory or a National Metrology Institute (NMI) providing their service is suitable for the intended use. When a forensic service provider has its own in-house calibration services, it should demonstrate its competence to perform such calibrations in accordance with relevant criteria for metrological traceability in ISO/IEC 17025.

A forensic service provider may need to consider purchasing calibration services from non-accredited calibration laboratories. In such cases, it is recommended to seek advice from a National Metrology Institute or a NAB on what aspects should be considered.

#### 5.6.4.1.1 Calibration checks between recalibrations

When relevant, calibrated equipment should be subjected to in-service checks between regular recalibrations in order to demonstrate the use of equipment is continually fit for purpose. When a forensic service provider considers these in-service checks necessary to maintain confidence in the performance of equipment, the in-service checks would be carried out according to a written procedure which include the nature of such checks, the frequency and defined acceptance criteria.

#### 5.6.4.1.2 Guidance on calibration and in-service checks

When defining calibration procedures and in-service checks between recalibrations, a forensic service provider should consider such factors as:

- which equipment need to be calibrated and allowed tolerance of calibration, if relevant;
- which equipment need to be checked between recalibrations and allowed tolerance of in-service checks between recalibrations;
- selection of an external calibration laboratory or in-house calibration services;
- evaluation of the information of a calibration certificate;
- archiving of calibration certificates or calibration results;
- recording results of in-service checks;
- actions if in-service checks are not within the specified limits.

#### 5.6.4.1.3 Guidance on which measurement equipment need calibration

ILAC G19: 4.4.5 and ANAB MA 3012: 7.15.15 provide some examples of which measurements equipment used in CSI would need calibration and/or functional checks in the maintenance program. Examples include thermometers, sound meters, 3 D scanners, calipers, gas detectors, photo ionization detectors, GPS for site identification/logging, laser telemeters, rulers, micrometers, and measurement devices for recording distances and dimensions, data-loggers used for recording weather information, scales and weighing instruments.

These examples may be useful when considering which measurement equipment has a significant influence on the outcome of inspection and the forensic result. However, it is the responsibility of a forensic service provider to specify such measurement equipment.

#### 5.6.4.2 Maintenance

A forensic service provider should have written maintenance procedures for all equipment that influences the quality of the forensic results. The maintenance procedures and program should include how functional checks are carried out in order to ensure only properly operating equipment in accordance with the requirements used in CSI. Maintenance procedures should include necessary service actions.

In addition, the procedures should cover actions when the performance of equipment is not within the limits and/or is not satisfactory, as well as removal and appropriate labelling of defective equipment. For such equipment, a forensic service provider shall investigate the impact of the defects on previous inspections and carry out appropriate corrective actions where necessary.

#### 5.6.4.2.1 Functional checks/verification as part of a maintenance program

A wide range of equipment is used in CSI, and a forensic service provider should specify equipment needed to be checked before use.

Some pieces of equipment used at the scene of crime have self-checks and/or automated calibrations. Some are not subject to effects of transportation, and require only verification. Others may require use of a reference material that validates the calibration and function status as shown to be satisfactory.

ILAC G19 gives some examples of portable equipment used at the scene that needs calibration or checking according to a prescribed maintenance program before taken to the scene.

For example, digital photography equipment should be checked for suitability with a test chart to show resolution, sharpness, contrast and distortions etc. (e.g. when photographing fingerprints and footprints). Correct and faithful color response is also essential in crime scene work and therefore may require use of reference color card (e.g. when photographing bruises and injuries).

Verification of equipment performance shall be conducted by staff with the recognized competence to operate and verify the equipment.

If a forensic service provider is responsible for storing e.g. reagents, reference material or perishable exhibits that are instructed to be stored in a refrigerator or freezer. In this case, the temperatures of such equipment shall be checked with a calibrated thermometer to ensure it is functioning properly within specified limits and to demonstrate continuing fitness for purpose.

#### 5.6.4.2.2 Cleaning procedures as part of a maintenance program

Potential contamination risks should be considered in the maintenance procedures of equipment. A forensic service provider should identify equipment that is susceptible to contamination. Preventive anti-contamination activities should be taken to minimize cross-contamination, for example when moving from a scene to another as well as during storage and transportation of equipment. Procedures should cover the proper cleaning of such equipment and surfaces using validated cleaning methods before and after CSI. Procedures should also include a monitoring system to demonstrate the effectiveness of the cleaning carried out.

Performed maintenance and monitoring activities of equipment including vehicles should be recorded as described in a QMS.

#### 5.6.4.3 Operational usage

A forensic service provider shall have written policies and procedures for defining the conditions under which equipment can be used. The environmental conditions should be recorded with calibrated equipment, if applicable and note if conditions are outside the limits within which inspection can be performed.

Disposable equipment is widely used in CSI work. A forensic service provider should have policies and procedures for the use of disposable equipment to ensure that such equipment does not contribute to contamination through misuse or re-use. Specified disposable equipment should be tested/validated and monitored in order to ensure they are DNA grade, see Section 5.6.6.

Furthermore, a forensic service provider should have available instructions/standard operation procedures for the use of equipment at scene.

### 5.6.5 Computers and automated equipment

ISO/IEC 17020 specifies the requirements for the use of computers or automated equipment for inspections. It provides practical examples of how computer software is considered suitable for use in inspections. A forensic service provider shall ensure that it has established and implemented procedures for protecting the integrity and security of data. In addition, a forensic service provider shall ensure that computers and automated equipment are maintained to ensure proper functioning.

Sources and references:  
ISO/IEC 17020: 6.2.13

### 5.6.6 Consumables, reagents, forensic kits and reference materials

Crime scene investigators use a wide range of equipment to collect samples, including consumables, reagents and forensic kits. It is important to ensure that consumables do not have any adverse effect to the samples collected and consequently do not compromise the evidential value of the samples. Therefore, it is the responsibility of a forensic service provider to ensure and demonstrate that consumables, forensic kits, materials and reagents are always fit for their intended use. Consumables that come into physical contact with the evidential sample are considered the most critical.

It has been recognized that manufactures play an essential role in producing and manufacturing appropriate supplies and material for the use of forensic service providers. The requirements of the standard ISO 18385 *Minimizing the risk of human DNA contamination in products used to collect, store and analyse biological material for forensic purposes - Requirements* [11] are addressed to manufactures and aim to minimize the risk of human DNA contamination in products used to collect, store and analyse biological material for forensic purposes. The same purpose is served by the British standard PAS 377 *Specification for consumables used in the collection, preservation and processing of material for forensic analysis - Requirement for product, manufacturing and forensic kit assembly* [29]. The information in the abovementioned publications can be used to define technical specifications of consumables.

A forensic service provider may undertake testing such as presumptive tests or screening tests as part of CSI. In such cases, the inspection activities and documented procedures should meet the relevant requirements of ISO/IEC 17025 [2].

A forensic service provider should have written policies and procedures in a QMS to ensure the suitability and reliability of consumables, reagents, forensic kits and reference materials in use considering following aspects:

- defining specifications for supplies (consumables, reagents, forensic kits and reference materials) in use fit for purpose. It should be noted that "sterile" is not the same as "DNA free" or "DNA grade";
- defining criteria for inspections (checking), acceptance/rejection and storage of consumables;
- initial validation of forensic kits and reagents to comply with the set specifications and on-going lot/batch testing;
- verification (checking) of the suitability of consumables and packaging e.g. through initial commissioning and on-going lot/batch testing;
- maintaining a list of reagents;
- labelling every reagent and reference material appropriately indicating:
  - identity of reagent and reference material (name), concentration (where appropriate), date of preparation or receipt, date of opening, date of expiry date; identity of preparer, hazard warning (where necessary), storage conditions (if relevant);
  - national regulations or organisational policy on health and safety requirements and use of hazard warnings should be followed;
- ensuring correct handling, storage and transport of consumables;
- ensuring appropriate storage facilities;
- assessing the condition of stored products at appropriate intervals to detect deterioration (where applicable) and keeping records of these checks, if applicable or relevant;
- keeping records on verifications of incoming supplies and on-going lot/batch testing.

Sources and references:

ISO/IEC 17020: 6.2.12

ILAC P15: 6.2.11 n2

ILAC G19 3.12.5, 3.12.6, 4.4.5, Annex D

ENFSI-BPM-SOC-01: 4.3, 4.5

UKAS RG 201:6.2.2, 6.2.6, 6.2.8, 6.2.9

ANAB MA 3012: 7.15.20, 7.15.21

#### *5.6.6.1 Guidance on verification of consumables*

Defining specifications of consumables is an important starting point for considering the need of verifications. Specified consumables should be DNA grade for the use of CSI. Manufactures of these consumables may perform test in order to demonstrate the requested quality level of their products is fulfilled by certificates. However, it is on a forensic service providers' responsibility to decide which consumables should be verified according to set specifications to ensure their suitability for CSI.

On-going batch testing of consumables (e.g. PPE, packaging) may need results of laboratory analysis in order to evaluate whether a new batch would comply with the set specifications or requirements (e.g. DNA grade). In such cases, it would be good to collaborate with the forensic laboratory.

#### *5.6.6.2 Guidance on verification of a new lot/batch of reagent*

When defining verification procedures for a new lot/batch, the following aspects may be considered:

- checking of labelling and condition of the package and the contents;
- checking of the certificate;
- testing by comparing a new lot/batch with the old one before taken in use by using a reference sample;

- documentation of the results of these tests and approval of the verification fit for intended use;
- collaboration with the national forensic laboratory, if necessary.

#### 5.6.6.3 *Guidance on verification of forensic kits for presumptive tests*

It would be necessary to test a new lot/batch of forensic kit by using appropriate positive reference material and negative reference material according to manufacturer's instructions. In the verification of forensic kits for blood, semen, saliva, urine, a forensic service provider should consider where these tests are carried out and by whom. It is recommended that human based reference material is not handled at authentic crime scenes. The verification of forensic kits could be done in collaboration with the forensic laboratory providing the information and the test results are available for the purpose of CSI.

Traceability of the reference material should be recorded and storage procedures shall be considered, for instance how long the reference material is valid, fit for purpose.

#### 5.6.7 Purchase of services and supplies

Suppliers have an important role in providing materials and services to the demand of the forensic process. A forensic service provider is responsible for ensuring the suitability of purchased materials and services fit for the intended use. A forensic service provider should have written policies and procedures for the selection and approval of suppliers as well as use of purchased services, equipment and supplies that affect the quality of its service. Procedures should cover purchase, receipt and storage of relevant supplies.

It is crucial that purchased supplies, which have an effect on the quality of investigation and/or examinations, are not used until they are verified to meet defined specifications or requirements in the methods concerned. A forensic service provider should maintain appropriate records on purchased services, supplies and products. Records could include e.g.: a list of approved suppliers and service providers, evaluation of suppliers and service providers, verification of purchased supplies in compliance with specifications before use.

A forensic service provider should define and document what criteria are valued and prioritized in the selection and evaluation of suppliers and service providers. For example, aspects can be considered such as reliability of delivery, good and fast service, previous good experience, accreditation/certification.

Sources and references:  
ISO/IEC 17020: 6.2.11  
ILAC P15: 6.2.11 n2  
ILAC G19: 3.12.1

### 5.7 Subcontracting

A forensic service provider should normally perform the work for which it has been contracted. However, there might be situations where a forensic provider would not necessarily be able to perform an assigned task or a part of it in unforeseen circumstances such as unexpected workload, equipment failure and staff incapacity. Regarding a complex case or large incident such as multiple murder case or a terrorist attack, the investigation would require resources also from other crime scene units or forensic service providers. Coordination with other forensic units and/or subcontractors is essential to ensure the integrity of the scene and the value of all exhibits from the scene, and relevant guidance regarding this matter is provided in ILAC G19: 4.1.3, 4.2.2, 4.3.5.

A qualified subcontractor may be used to carry out any part of a CSI. It is the responsibility of a forensic service provider to ensure that the subcontracting process is under control and that it has documented procedures in its QMS. A forensic service provider should have procedures covering competence and impartiality of a subcontractor as well as meeting customer requirements. A forensic service provider should consider that in national or European legislation or standards may have additional sector-specific requirements for the use of subcontracting.

Whenever subcontractors perform work that forms part of an investigation and/or examination, a forensic service provider retains the responsibility for determining the conformity of the forensic item with the requirements.

The requirements of ISO/IEC 17020 for subcontractors apply when the subcontracted work falls within the scope of a forensic service provider's competence (scope of accreditation) and the subcontractor's results are included in the forensic service provider's (agency's) own report.

Part of the contract from the customer might involve inspection not covered by a forensic service provider's scope or being beyond the capability or resources of a forensic service provider. For example, the investigation requires specific expertise that a forensic provider does not currently hold such as entomology, anthropology, or botany. ILAC P15 specifies that accreditation cannot be granted for the activities referred to in the fourth bullet point of note 1 of 6.3.1 of ISO/IEC 17020, if the inspection body does not have the required competence and/or resources. However, the task of assessing and interpreting the results of such activities for the purpose of determining conformity may be included in the scope of accreditation, provided adequate competence for this has been demonstrated.

Sources and references:

ISO/IEC 17020: 6.3.1, 6.3.2, 6.3.3, 6.3.4

ILAC P15: 6.3.1 n1, 6.3.3 n1, 6.3.4 n1, 6.3.4 n2

ILAC G19: 4.1.3, 4.2.2, 4.3.5

ANAB MA 3012: 7.16.1, 7.16.2, 7.16.3, 7.16.4, 7.16.5

### 5.7.1 Competence of the subcontractor

When a forensic service provider subcontracts any part of the investigation, it shall ensure and be able to demonstrate that the subcontractor is competent to perform those activities and that it meets the relevant requirements of ISO/IEC 17020 or other relevant conformity assessment standards, where applicable.

A forensic service provider shall provide appropriate evidence of the subcontractor's competence, such as accreditation certificates or documentation of assessments performed by qualified personnel in accordance with appropriate procedures. A forensic service provider could consider having qualified personnel conduct an audit of the subcontractor, if necessary, in accordance with applicable requirements of ISO/IEC 17020 or other relevant standard to ensure the subcontractor has the required competence for the task assigned.

ILAC P15 specifies that accreditation is the preferred method of demonstrating the competence of a subcontractor, but in justified situations (on the basis of qualified evaluation/professional judgement) results from non-accredited subcontractors could be accepted. If the evaluation of the competence of a subcontractor is based partly or in full on its accreditation, the inspection body shall ensure that the scope of a subcontractor's accreditation covers the activities to be subcontracted.



A forensic service provider may contract a range of work under one contract. It is important to consider what a forensic service provider has contracted to deliver. The customer may require all of the work or parts of the work to be covered by accreditation.

A forensic service provider shall record and maintain details of its investigation into the competence of its subcontractors and their competence with the applicable requirements of ISO/IEC 17020 or other relevant conformity assessment standards. A forensic service provider shall keep a register of all subcontractors. Records should involve traceability of work undertaken by the subcontractor and the compliance with ISO/IEC 17020 or other relevant standard for the work covered.

### 5.7.2 Information to the customer

A forensic service provider shall inform the customer of its intention to subcontract any part of the inspection. The information requirement does not mean to seek permission from the customer for the use of subcontractors. The ISO/IEC 17020 standard does not specify when information should be provided to the customer. In CSIs there might be occasions when information might not be possible prior to the investigation and as such the customer should be informed as soon as possible after the investigation of the crime scene.

### 5.7.3 Reporting results of the subcontractor

A forensic service provider should pay attention to how the results of a subcontractor are reported. When a forensic service provider's report contains results of the inspections/ examinations performed by a subcontractor, these results shall be clearly identified.

## 5.8 Inspection methods and procedures

Crime scene investigation (CSI) is a multidisciplinary area, which involves a number of processes leading to gain knowledge on the perpetrator and the events accompanying the incident or crime. The purpose of CSI, i.e. establishing what happened and identifying the offender, is achieved through the recovery, interpretation, collection and preservation of the evidence. CSI consists of careful observation and examination of a scene, persons, objects or dead bodies carried out with the use of human senses and technical means in order establish the circumstances and character of a crime and the offender.

The quality of each activity performed at the crime scene is paramount for further utilization of collected information in criminal proceeding. Each stage of CSI makes up a coherent system, where various processes interact with each other and shape the model of investigation. One of the aims of accreditation of crime scene activities is to demonstrate that processes and procedures meet established standards and are conducted accordingly.

The fundamental goal of investigation is to reconstruct the course of events and secure material evidence for further criminal proceedings. The methods of investigation (inspection) should primarily address the selection of investigation team(s), the activities to be performed before entering the scene (planning, provision of resources) and after entering the scene, organization and methods of conducting the investigation, closing the scene, documentation and results of investigation, utilization of results.

The procedures or methods, specified in regulations (e.g. police regulations) or client specifications (such as prosecutors/investigators) can be used. Any procedure which is used should be accompanied by a written documentation (instructions/checklists/standards, reference data, where

appropriate). In absence of the above, they should be developed, modified when needed and available to the personnel involved. In handling the evidence, the use of methods and resources fit for particular purpose should be ensured. The forensic service provider should have documented procedures which can appear in form of standard investigation/examination method (developed by external standard body or reputable technical organization and published) or non-standard investigation/examination method (developed by the forensic service provider itself or by the customer).

Sources and references:  
ISO/IEC 17020: 7.1

### 5.8.1 Documentation of inspection methods and procedures

The purpose of documenting inspection methods and procedures is to ensure that examinations at crime scenes are conducted in a consistent and safe manner by all investigators. All CSI examination activities shall be appropriate and fully documented including health and safety aspects as well as quality assurance procedures, where appropriate. These involve examination strategy, crime scene photography, measurement and sketching, evidence labelling, sampling and collection methods, etc.

Examination methods shall be fit for purpose and a forensic unit demonstrating this shall refer to appropriate validation/verification data. The scientific community can have conducted validation studies on standard or published methods. A forensic unit is responsible for performing validation of methods developed in-house and verification of standardised examination methods.

ILAC G27 *Guidance on measurements performed as part on an inspection process* [17] provides recommendations on how to approach situations where examinations that form part of an inspection assignment include the performance of measurements. The document covers the case when inspection is performed fulfilling the requirements of ISO/IEC 17020 and when the performance of measurements may require consideration of the requirements of ISO/IEC 17025. ILAC G27 specifies that the issues of metrological traceability, validation of methods and quality assurance to ensure proper performance of methods shall be considered separately and individually for each examination including measurements. Annex D of ILAC G19 outlines the key relevant areas of ISO/IEC 17025 that a forensic unit should meet when carrying out examinations/tests as part of an inspection activity.

It is important that all instructions, standards or written procedures, worksheets, check lists and reference data relevant to the work of the forensic service provider shall be maintained up-to-date and be readily available to the personnel.

Sources and references:  
ISO/IEC 17020: 7.1  
ILAC G19: 3.10, Annex D  
ILAC G27

#### 5.8.1.1 Processes at the crime scene

The processes at the scene need careful planning according to defined requirements. The aim of CSI process involves establishing the truth about the course of events by utilizing the optimum potential of recovered evidence and gathered information. Therefore, the activities shall be based on systematic and objective approach and should be appropriately planned and documented.

The guidance ILAC G19 defines the purpose of the forensic science process and the series of steps from the time a forensic unit is notified of an incident until the presentation of findings together with a description of the activities that take place at each step.

The processes at the scene of crime are described in ILAC G19 (see chapter 4) and these include several steps to ensure a coherent and complete investigation, such as undertaking initial actions at the scene, developing a scene of crime investigation strategy, undertaking scene of crime investigation and documenting the scene.

Examination strategy/plan is crucial in terms of accommodating the needs of the customer (investigator, prosecutor), which usually is to maximize the evidential value of forensic traces. Usually, the strategy/plan is elaborated by crime scene manager and takes into the account further examination possibilities; naturally the strategy can be reviewed and adapted to new circumstances. It should be kept in mind that the examination strategy is also important from the point of view of further conformity assessment against established procedures in place.

In ISO 21043-2 *Forensic sciences – Part 2: Recognition, recording, collecting, transport and storage of item* the processes of planning, assessment, initial action, preservation of the scene, recognition, recording, documentation, handling of items, closure of the scene, reporting are referred to more specifically in terms of forensic application at the scene. In Chapters 5 to 6, the processes and responsibilities at the crime scene are described with consideration to the overall aim of the activity. These include: first responder actions, forensic response, assessing the crime scene, examination strategy, review and closure of the crime scene.

ENFSI BPM for Scene of Crime Examination [20] refers to the general methodology to be applied in a particular crime scene examination (e.g. volume crime vs. major crime). The generalist methodology includes the following stages:

- arrival at the crime scene;
- initial assessment of the crime scene;
- examination of the crime scene;
- search and collection of traces in the crime scene and its surroundings;
- completing the crime scene examination;
- peer review.

The guidelines contained in ENFSI BPM for Scene of Crime Examination [20] can be also used as a helping tool in establishing and maintaining working practices to ensure a robust evidence of high quality. They could be also followed in order to elaborate examination strategy according to main processes of crime scene inspection.

Sources and references:  
ILAC G19: 4  
ISO 21043-2: 5, 6  
ENFSI-BPM-SOC-01

#### 5.8.1.1.1 Health and safety aspects

The site where the effects and impact of the incident are examined may also represent the area where various health and safety hazards can be encountered and threaten the personnel working at the scene. These hazards include for instance, damages to structures, machines or technical devices, damage to various technical installations. Other sources of potential hazards include chemicals (e.g. for drug production), biological materials (viruses, bacteria, body fluids), radiological or nuclear exposure, unexploded devices, firearms, environmental factors (mud, temperature), sharp devices, to mention just a few.

Whilst performing tasks at the scene, the type and range of hazards is the unknown, unpredictable factor, hence occupational health and safety principles should be carefully selected and applied according to the assessment of the scene. These should be considered in terms of the risks that may occur. Basic health and safety principles should be implemented in each unit and followed across all stages of crime scene processes, aiming at protection of personnel. The investigator in charge is responsible for ensuring health and safety measures on site as well as identification and possible elimination of all risks and hazards. Investigators should also cooperate effectively with other services present at the scene, in particular fire brigade or emergency services.

The importance of health and safety aspects is stressed in ISO/IEC 17020 section 7.1.9, which states that the inspection body shall have documented instructions for carrying out inspection in a safe manner. In CSI, these may include occupational health and safety standards including the checklist of personal protective equipment (PPE).

In ISO 21043-2, health and safety issues are addressed in chapter 5.4, which underlies that the risks should be assessed throughout the entire forensic process and identified. The Annex A to the standard helps to identify potential hazards and refers to the level of PPE to be ensured at the scene.

Sources and references:  
ISO/IEC 17020: 7.1.9  
ISO 21043-2: 5.4, Annex A

#### 5.8.1.1.2 Minimizing contamination

All the activities carried out by crime scene investigators at the crime scene should be carried out in such a way as to ensure a rational and safe use of available resources, i.e. the personnel involved, equipment and materials. It should be noted that the investigation of a crime scene, as unrepeatably by nature, is to be performed at the highest quality level, whilst adhering to standards that guarantee objective and reliable performance. The protection of evidence against contamination and protection of officers conducting the activities on site constitute equally important aspects to be taken into account during scene examination.

Minimizing contamination refers to the whole scene environment, but in particular it aims at prevention of contamination to the personnel, to the evidence and between samples (cross-contamination). With regard to the need to provide reliable evidence, any possible measures should be taken in order to avoid contamination, which is understood as:

- alteration of identification features of collected evidence (e.g. accidental change of properties of the trace);
- transfer as a result of contact with objects and personal protective equipment, transfer between particular items (e.g. pieces of clothes of victims and suspect), leaving evidence or exhibits with no packaging or protection;
- introduction of random traces not linked to the crime scene to the evidence, e.g. collection of traces belonging to crime scene personnel.

Advanced and sensitive methods of forensic examination of all types of evidence, in particular trace evidence, require stringent application of anti-contamination principles throughout the entire forensic process. The protection of evidence against contamination shall start from first responder action and be continued until the material is submitted to the laboratory and the analysis is complete. The protection measures can include, however not limiting to, wearing protective

clothing, controlling the entry to the scene, not allowing any food or drinks at the scene, avoiding moving items or persons unless it is necessary.

The minimization of cross-contamination between involved persons, victims, physical material, facilities, equipment, the collector and/or scenes should be avoided. The measures can include time and space separation between collection of samples from victims and suspected, using disposable equipment for collection of samples, making sure the equipment is decontaminated after each use, using DNA grade products, reducing the number of persons accessing the scene (controlled entry) or establishing safe and monitored areas for storage and handling of equipment. Also the high awareness of contamination issues by all the personnel involved is required.

Environmental conditions which are critical for the outcome of the results of forensic examination shall be monitored and recorded, especially with regards to the equipment, work areas, clothing and consumables and any changes which might occur and have the impact on deterioration of forensic evidence. A particular attention should be paid to handling the materials with trace quantities, such as DNA and gunshot residues. Other aspects include the use of personal protective equipment, restricted and controlled access to crime scene, early identification of potential contamination and its sources.

Sources and references:  
ISO 21043-2: 5.8, Annex B  
ILAC G19: 3.11

## 5.8.2 Contracts and work orders

The purpose of contracts or work orders is to ensure a forensic unit has sufficient resources and competence to carry out the work and that a forensic unit and its customer have agreed on the scope of the work to be done. Contracts can be formal requests or verbal work orders, if acceptable. A forensic unit is responsible for keeping a record of all requests received, including verbal work orders.

A contract review should be carried out before the work starts. However, in CSI it is not always clear what the scope of the work is, before the investigation begins. If the initial visit at the scene shows that the assumptions made in the contract review do not reflect the situation at the scene, the relevant steps of the review may need to be repeated. For routine or repeat work orders, the review may be limited to considerations of time and human resources and an acceptable record in such cases can be a signed acceptance by an appropriately authorised person.

Sources and references:  
ISO/IEC 17020: 7.1.5  
ILAC G19: 4.1.1, 4.2.1

## 5.8.3 Handling inspection items and samples

The procedures for handling inspection items and samples refer to the chain of custody from the arrival at the scene up to the presentation of evidence to the court. The forensic unit shall take appropriate precautions to ensure that the identified items and samples taken for further examination are recovered, stored and transported without loss or contamination. The requirements include;

- unique identification (labelling) of items and samples;
- having documented procedures and appropriate facilities to prevent deterioration or damage of items and samples;

- an appropriate recording system to provide the information on the items and samples at any time.

These measures shall ensure systematic evaluation. Items collected and the locations at which they were found shall be documented or characterised using suitable procedures e.g. measurements, plans, diagrams, photography, photogrammetry, so that they can be identified at all times and the locations at which they were found can be determined. The identity for items and samples shall be maintained in the entire documentation, including the inspection report.

The forensic unit should perform a search pattern according to a structured procedure, at least in the area of major crime. Records of this should be maintained. The collection of items and samples shall be conducted in accordance with the processes and procedures in the QMS.

Appropriate precautions and procedures are required and shall be observed when dealing with potentially dangerous substances and items. For legal purposes, the forensic unit shall maintain a 'chain of custody record' for items and samples whilst under its control. This record shall detail each person or organization who takes possession of an item or alternatively the location of that item (e.g. if in storage).

Sources and references:

ISO/IEC 17020: 7.2

ENFSI-BPM-SOC-01: 8.2, 8.3, 8.4

#### 5.8.4 Inspection records

Each activity performed at the crime scene investigation shall be documented. The documentation can involve, however not limiting to: notes, photo or video documentation, 3D scanning, voice recording, sketches, drawings, or plans. It is important to bear in mind that the records shall be maintained and made available for any case reviews, reconstructions, audits and court requests in the future, therefore each information should be easily retrievable and identifiable to support the process of interpretation and conclusion. The records of the activities performed and observations are used as primary source of information in the inspection report, therefore the document auditable trail shall be ensured. The complete documentation should be maintained according to the requirements of chain of custody in the organization and the procedures how to create and maintain records relating to investigated case should be implemented and followed.

Sources and references:

ISO/IEC 17020: 7.3

ILAC G19: 3.5

#### 5.8.5 Inspection reports

The inspection report is the fundamental document, which summarizes the course and findings of scene examination. Whether used for accreditation purposes or quality assurance, the drafting of inspection report shall take into the account the essential information required by ISO/IEC 17020. The report shall contain the formal elements, such as identification of the issuing body, date of the inspection and date of issuing the report, unique identification, identification of items (exhibits), signature of authorized persons, inspection results.

All the findings and observations should be reported in a correct, clear and accurate manner. The reports should be unambiguous and impartial. The important aspect of the inspection report involves providing the objective and factual information, which means that own conclusions, judgements or attribution of identification (for persons and items) should be avoided. The inspection records used to draft the report shall be consistent with its contents, which means that

documentation, such as photographs, evidence tags, or sketches shall be referenced to adequately in the text.

The report should be approved before delivery to the customer and peer reviewed when necessary (major crimes, complex crime scenes, etc.).

The inspection report as well as auxiliary documents (inspection records) constitute the primary source of information for the investigation and evidential process and should be retrievable at request. Therefore, there should be a strategy in place to ensure the integrity of reports and archiving.

Sources and references:  
ISO/IEC 17020: 7.4  
ILAC G19: 4.6, 4.8, 4.9  
ENFSI-BPM-SOC-01: 11.1

## 5.9 Tools for maintaining a Quality Management System

A QMS includes activities that enable the organisation to achieve its objectives by:

- a) identifying their objectives;
- b) defining work processes;
- c) utilising their resources.

To ensure that QMSs work as intended and are subject to continuous improvement, they shall be constantly monitored. There are many different tools for maintaining and monitoring QMS.

This section will describe the following elements of QMS in detail:

- internal audits;
- risk management;
- management review;
- quality assurance;
- proficiency testing;
- corrective and preventive actions;
- complaints and appeals.

### 5.9.1 Internal audits

The purpose of audits is to check that the QMS and work processes function as intended, that the available professional knowledge is sufficient and that safety is ensured.

Audits can commonly be divided into three main categories:

**First-party audits - Internal audits** are performed by personnel of the organisation, and shall reveal whether the quality management system works and is followed, whether the professional knowledge is sufficient and whether safety is maintained.

**Second-party audits** are performed by, or on behalf of, a customer in connection with a contract, to assess the organisation's quality management system and ability to carry out the assignment. The audit can also be performed during the execution of the assignment to show the progress.

**Third-party audits** are performed by an independent party, such as a certification body, to assess whether the organisation meets the requirements for a certificate.

### 5.9.1.1 Audit principles

The following seven principles are important when carrying out audits:

1. Integrity
2. Fair presentation
3. Due professional care
4. Confidentiality
5. Independence
6. Evidence-based approach
7. Risk-based approach

For a more detailed description of the audit principles, see ISO 19011:2018 *Guidelines for auditing management systems*.

A forensic service provider will prepare an audit programme to ensure that regular internal audits covering all aspects of crime scene examination are conducted (including operational aspects, research and development, training, skills and expertise).

### 5.9.1.2 Audit programme

The audit programme should include:

- a) Purpose and scope:  
Audit programme objectives. For forensic examinations, the objective may be to audit whether all requirements set out in ISO/IEC 17020 are conformed during the accreditation period.

The scope of the audit programme should be defined on the basis of a risk assessment in order to ensure an efficient approach based on the actual need. The risk assessment can be based on e.g. how often audits should be conducted, results of previous audits, appeals and complaints.

- b) For risks and opportunities relating to the audit programme and actions to manage them, see Section 5.9.2 Risk management.

The risks and opportunities relating to the audit programme should be identified, and they should be considered when the programme and resource requirements are decided.

The risk assessment can be based on assessments of what the critical elements are, the maturity of the organisation, previous achievements, changes to the organisation and management, changes to procedures and how efficiently experience is shared.

- c) Schedule. Preparing schedules for internal audits in the accreditation period and for each calendar year is recommended.
- d) Audit criteria for crime scene examinations should include:
  - Responsibility – determining who bears overall responsibility for internal audits (e.g. quality supervisor).
  - All ISO/IEC 17020 requirements shall be revised during the accreditation period.
  - Criteria for selecting audit team members.



- The quality supervisor or whoever is in charge of the audit programme should propose an audit team based on the skills and expertise of the members and the scope of the audit. An audit team leader should be appointed. The final decision on the make-up of the audit team should be taken by the management.

e) Audit methods

The quality supervisor or the person in charge of the audit programme should select and decide which data gathering methods to use. The audit may be conducted on site or remotely, or as a combination. There are many different audit methods that can be applied individually and together to collect data, such as:

- random samples from completed cases or work processes;
- statistical sampling from completed cases or work processes;
- document reviews;
- vertical audits (following one assignment from start to end, and examining all processes and registrations included in the assignment);
- horizontal audits (reviewing one element of the QMS, one procedure etc. by taking many random samples);
- audits of practical work.

f) Overview of relevant governing documents which should be included in the audits.

g) Resources

*Equipment:*

The audit team shall have access to governing documents (including controlling and complementing documents) and case documents. Correct clothing and protective equipment for visits to crime scenes/audits of practical work will be necessary.

*Personnel:*

Requirements for audit technique skills and expertise shall be set and the skills and expertise of the audit team members shall be maintained. As a minimum, auditors need to have competence in ISO/IEC 17020. Staff training can take place either internally or in courses provided by external, commercial suppliers. The auditor should avoid auditing his own work. To ensure variation in the audits, efforts should be made to avoid using the same auditor several years in a row. Competent external contract personnel can also conduct internal audits.

Proper preparation before the audit itself is important. The size of the selected audit team will depend on the type of audit. A team of two or three auditors is often sufficed. At least one team member should have skills and expertise within crime scene work or the field of expertise in question.

The audit team should hold planning meetings with the management to define the purpose and framework of the audit. If the field of expertise has been the subject of a previous audit, the actions following the previous audit should be reviewed. The audit team can also hold its own preparation meetings.

The audit team leader should issue audit invitations well in advance of the audit day itself. The invitation should provide information about the purpose of the audit, who will be audited, how the audit will be conducted and the schedule for the audit.

The audit itself will generally start with an opening meeting where the purpose and framework for the audit are presented to the participants.

Various sources of information and methods can be used during the audit:

- interviews;
- observations of practical work, activities, premises and working environment;
- reviews of documented information;
- reviews of registrations;
- data summaries;
- feedback from customers/stakeholders;
- reviews of databases and websites;
- simulations and modelling;
- reconstructions.

The results of the audit will be presented orally during a closing meeting. The findings observed during the audit will be reported in writing, and it is common to divide these observations into the following:

- conformities, i.e. findings that confirm that the audited fields of expertise and processes conform to the requirements in ISO/IEC 17020 and the requirements in the forensic service provider's governing documents;
- non-conformities, i.e. findings that show that work has not been performed in conformity with the requirements in ISO/IEC 17020 and the requirements in the forensic service provider's governing documents;
- comments will often be proposed improvements that are not linked to non-conformities (but which may become non-conformities later).

The audit will be documented in writing. The forensic service provider should prepare a suitable reporting form for audits.

All audits should be evaluated after conclusions have been made. The audit team and the quality supervisor should review what worked well and what can be improved upon. The skills and expertise of the auditors should in particular be evaluated to identify any need for more training or whether the auditor possesses skills and expertise that should be shared with other auditors.

Sources and references:  
ISO/IEC 17020:8.6  
ISO 9000:2015  
EN ISO 19011:2018  
ILAC P15: 8.6.4 n1  
ENFSI-BPM-SOC-01: 4.1.9  
ANAB MA 3012: 7.27.1

## 5.9.2 Risk management

The purpose of risk management is to enable an organisation to identify, prioritise and manage risk in order to create and protect assets. Risk management will help improve results, achieve objectives and ensure innovation/continuous improvement. The risk management can take a form of the QMS procedure within the organization.

Risk management is a tool in the work to solve governance-related problems faced by the management. It will help ensure more objective-oriented management, and thereby also simpler management, by enabling the management to use their time on the most important aspects.

It is common to assess two aspects of risk:

- the probability of the risk materialising;
- the expected consequences of the risk should it materialise.

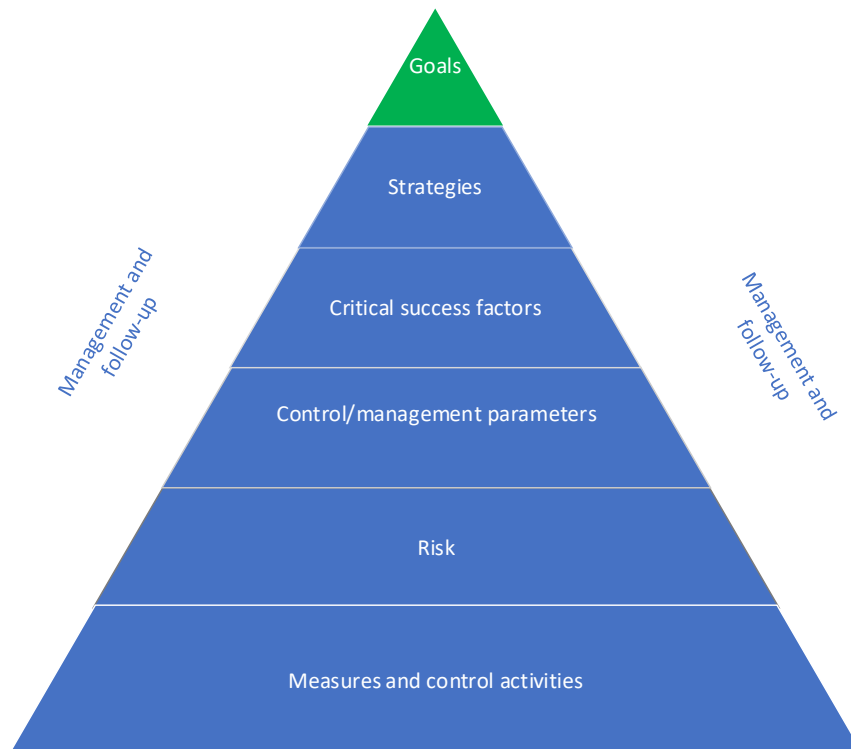
ISO/IEC 17020 only requires identifying risks to impartiality. There are no requirements to risk management beyond that, but it would be good practice to manage the risks of:

- performance management;
- work processes and daily operations;
- resources (staff, devices and equipment and sub-suppliers);
- safety.

Risk management consists of two main components:

1. Risk assessment (risk identification, risk analysis and risk evaluation/prioritisation);
2. Risk handling (preparing risk-reducing actions and following up risk).

Risk assessment is a systematic process where available knowledge is used to describe and evaluate risk. To evaluate risk relating to attainment of objectives, the forensic service provider shall have established clear objectives. The process shall ensure that various factors detrimental to attaining objectives or posing a risk of injury, damage or loss are identified. The importance of the factors is analysed in a risk analysis.



(Source: dfø.no)

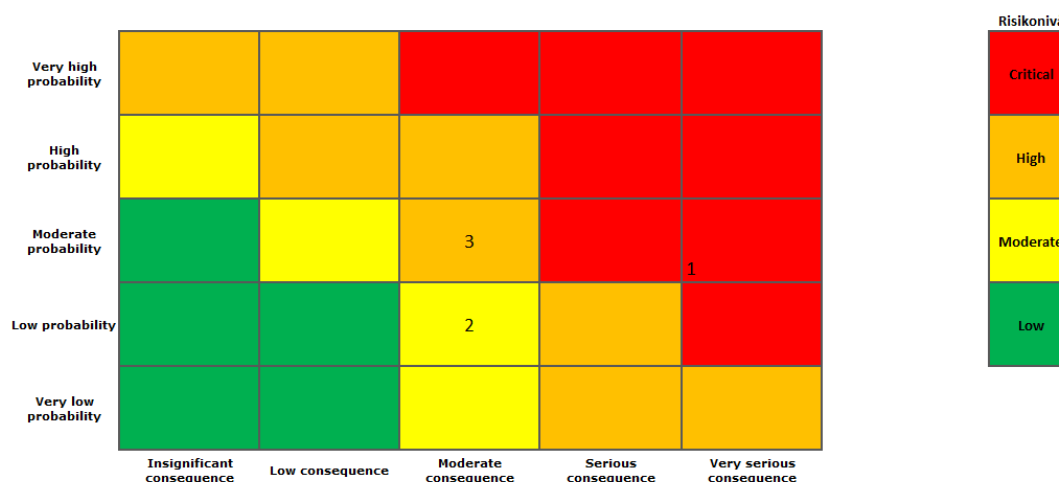
Risk assessments should be performed for overall objective attainment (strategic enterprise level) and for the department and/or section levels.

To provide uniform assessments of the different probability and consequence levels, it will be important to prepare clear and uniform explanations for the different levels.

Example of a risk management form:

Risk information					Current risk			Comments
Risk ID	Risk name	Occurrence/risk description	Description of cause	Description of consequence	Probability	Consequence	Risk level	
1	Equipment	Necessary equipment is not available	The equipment is generally old and there is a risk that it may break down	The results of the examinations may be incorrect or it is not possible to carry out the examinations	Moderate probability	Very serious consequence	Critical	
2	Personel	Lack of human resources	Downsizing, no replacement at retirement. High average age for employees.	Loses specialist competence, longer case processing time and increased work pressure	Low probability	Moderate consequence	Moderate	
3	Health and safety	High sickness absence	Extensive use of home office due to Covid-19.	Extensive use of home office due to covid-19.	Moderate probability	Moderate consequence	High	

Example of a risk matrix that can be applied:



(Source: dfø.no)

### 5.9.2.1 Risk handling

The purpose of risk handling is to select and implement actions to mitigate the risk.

Risk handling is a repeated process to:

- formulate and select risk handling alternatives;
- plan and implement risk handling;
- assess the effect of the risk handling;
- decide whether the residual risk is acceptable;
- if not, implement actions for further handling [9].

Various risk handling alternatives shall be assessed and the most suitable actions selected on the basis of the risk level.

Plans for risk handling and how to follow up and monitor them should be prepared and implemented.

Documentation relating to risk assessment and risk handling efforts should in a consistent, clear and comprehensible manner present how risk is handled in the performance management.

Detailed guidance for risk management can be found in ISO 31000 *Risk Management Guidelines*.

Sources and references:

ISO/IEC 17020: 4.1.3/ISO/IEC 17025: 8.5

ISO 31000:2018

ILAC P15: Annex 1

### 5.9.3 Management review

The purpose of the management review is to determine the continued suitability, adequacy and effectiveness of the QMS in alignment with the strategic direction of the forensic service provider.

The aim is to ensure that the functions of the QMS remains effective for achieving the forensic service provider's objectives and intentions. This is achieved by:

- reviewing the forensic service provider's strengths and weaknesses;
- assessing the customer satisfaction;
- assessing costs caused by quality-related errors.

A procedure to describe the planning and implementation of the management review should be developed. The procedure should include:

- the purpose;
- who is responsible for planning, executing and following up on the management review;
- the management of the management review;
- who will participate in the review (top management, unit managers, quality supervisors, chief specialists etc.);
- preparations for the management review, including:
  - summons;
  - data collection;
  - data sorting and analysis to provide a QMS status report;
- determination of the agenda for the management review;
- follow-up of actions and evaluating their effect.

The example of issues that need to be taken into account during management review:

1. Actions from the previous management review and status reports for these actions;
2. Relevant internal and external changes within the organisation;
3. Objective attainment and formulating new objectives;
4. Evaluating the effectiveness of the QMS;
5. Results and follow-up from internal audits, and review of audit plans;
6. Status for preventive and corrective actions;
7. Follow-up of appeals and complaints;
8. Results from and follow-up of external audits;
9. Feedback from customers and employees;
10. Risk assessment results;
11. Assessment of whether the resources are sufficient;

## 12. Evaluation of training and expertise plans.

### Sources and references:

ISO/IEC 17020: 8.5  
EN ISO 9001: 9.3.1  
ILAC P15: 8.5.2 n1, 8.5.2 n2, 8.5.2 n3  
ENFSI-BPM-SOC-01: 4.1.8  
ANAB MA 3012: 7.26

### 5.9.4 Quality assurance

The purpose of quality assurance is that the forensic service provider should monitor crime scene examinations to ensure the reliability of examination results.

Quality assurance will serve to control that:

- inspections are performed by sufficiently skilled staff;
- equipment works;
- methods work.

In addition, quality assurance will help uncover any need for new methods and work processes.

The forensic service provider should prepare a plan or procedure for quality controls for use when providing on-site assistance, which should include:

- the subject of quality assurance;
- the responsible person for conducting the quality assurance and requirements for their skills and expertise;
- the kind of documentation of quality assurance.

For crime scene examinations, the quality assurance may consist of:

- observation on-site;
- use of reference materials;
- peer review reports.

### 5.9.5 Proficiency testing

The purpose of proficiency testing is to enable the forensic service provider to monitor its performance against that of other similar organisations.

ISO/IEC 17020 does not require proficiency testing, but recommends conducting them if possible.

In general, using proficiency tests supplied by official suppliers accredited according to ISO/IEC 17043 [10] is recommended.

It is important to document procedures to follow up that proficiency tests are conducted, documented and followed up consistently. A procedure may include:

- which proficiency tests will be conducted and how often;
- ordering of proficiency tests;
- receipt and holding of proficiency tests (to the extent feasible, proficiency tests should be camouflaged as any other case).

All relevant staff should participate in the proficiency testing over time and should

- review of the overall of the results of the proficiency testing;
- evaluate how the proficiency tests were held and their quality;

A proficiency testing procedure should include minimum requirements for an evaluation and a later evaluation report. An evaluation report may include the following:

- date for receipt of the test, replies sent, solutions received and evaluation;
- description of material received;
- how the test was conducted and by whom;
- results of own enquiries;
- solutions;
- evaluation of own results against the solutions and own requirements;
- description and registration of any non-conformities;
- description and registration of any actions.

The forensic service provider should set requirements for how to follow up any non-conformities or results that are outside of predefined criteria.

Sources and references:

ISO/IEC 17025: 7.7.2  
ISO/IEC 17043  
ILAC G19: 4.7.7.2  
ILAC P9  
ILAC G27  
EA-4/18 G

### 5.9.6 Corrective and preventive actions

The purpose of corrective and preventive actions is to ensure continuous improvement and systematic learning from experience.

There is a need for specific procedures to identify and manage non-conformities. Such procedures should include the following items:

- the responsibilities and authorities for the management of nonconforming work are designated and actions (including halting of work and withholding of reports, as necessary) are defined and taken when nonconforming work is identified;
- an evaluation of the significance of the nonconforming work is conducted;
- correction is taken immediately, along with any decision about the acceptability of the nonconforming work;
- where necessary, the client is notified;
- the responsibility for authorising the resumption of work is defined.

Corrective and preventive actions will be a proactive and continuous process to uncover non-conformities and generate improvement proposals. Below, you will find some examples of elements where opportunities for improvement can be identified:

- quality policy and the management system;
- management review;
- calibrations;
- regular inspections of methods and equipment;
- proficiency tests (collaborative exercises);
- use of certified reference material;
- internal audits;
- staff input through improvement proposals;
- cross-disciplinary quality improvement group;
- internal and external evaluation;

- training and expertise enhancement;
- participation in national and international specialist forums;
- quality control of case processing and reports;
- risk analysis.

Findings such as non-conformities and improvement proposals from the above elements should be analysed to determine possible causes. It can be hard to find the real causes of non-conformities. For instance, the following tools that can aid in finding root causes may be used:

- a) 5x why;
- b) Fishbone diagram;
- c) Process mapping;
- d) Scatter plot diagram.

#### 5.9.6.1 5x why

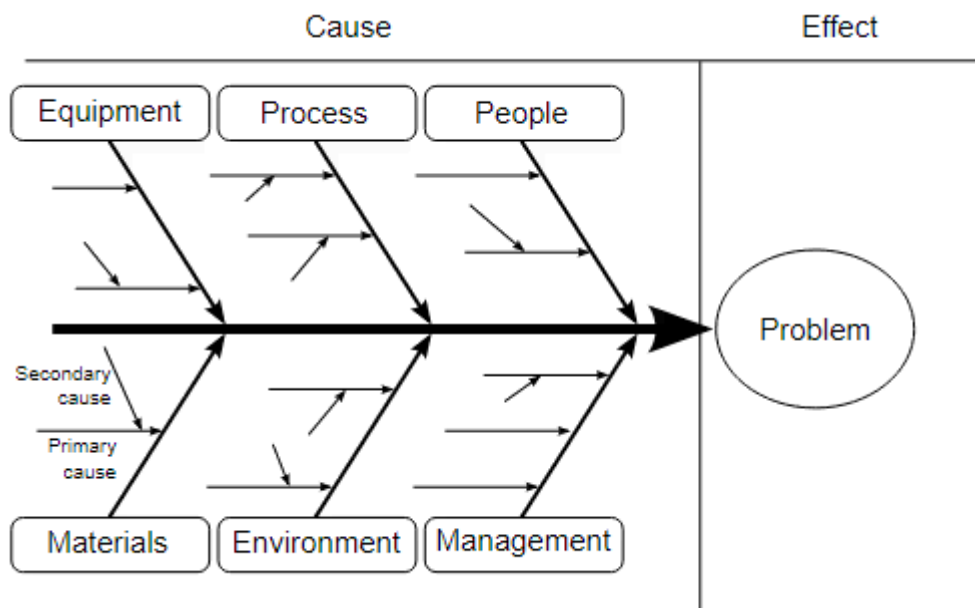
The key question in root cause analysis is "how could this happen?" To dig down to the cause, this question can be posed up to five times.

Briefly described, the method consists of the following items:

- select a problem area;
- ask why it exists/happens;
- select a cause and ask again;
- continue until the root cause has been identified.

#### 5.9.6.2 Fishbone diagram

To find root causes, you can use a fishbone diagram where causes are considered from different angles, such as in this example: people, processes, materials etc.



(Source: En.wikipedia.org.)



### 5.9.6.3 Process mapping

To improve a process, you shall understand it. Process mapping can help you to understand the process and see:

- how well the processes flow;
- which measurements are taken during the process to assure quality;
- whether there is agreement as to how the processes should be performed/whether the process is performed identically each time.

### 5.9.6.4 Scatter plot diagram

Scatter plot diagrams show the relation between two sets of data and are used to display or disprove hypotheses. They can show cause-and-effect connections.

Sources and references:  
ISO/IEC 17020: 8.7, 8.8  
ANAB MA 3012: 7.28.3  
UKAS RG 201: 8.7.1

## 5.9.7 Complaints and appeals

The purpose of procedures for handling complaints and appeals is to correct and prevent errors and deficiencies in the services provided to the customer. All customer feedback shall be taken seriously, in particular feedback in the form of complaints and appeals.

Appeals and complaints can come from a variety of sources such as customers, victims of crimes, police authorities, other departments within the same organisation and the criminal justice system. A documented process for receiving, evaluating and processing appeals and complaints is required. Information about the process shall also be easily available to anyone who wants to make a complaint or file an appeal.

Procedures should be prepared, requiring that:

- complaints are processed as quickly as possible and that all complaints are taken seriously;
- the complaint processing is recorded and can be verified;
- complaints are handled impartially by persons not involved in the matter the complaint concerns;
- the complainant is informed of the how the matter will be processed and the result of the complaint;
- complaints procedures are known to the stakeholders.

The complainant should receive confirmation of receipt of the complaint and be informed of how long the processing is expected to take. The complainant should also be informed of how the matter will be processed and the final result.

Sources and references:  
ISO/IEC 17020: 7.5, 7.6  
ILAC G19: 3.2  
ANAB 3012: 7.21.1  
UKAS RG 201: 7.5, 7.6

## 6. STEPS TOWARDS ACCREDITATION

## 6.1 Fundamental considerations

Accreditation shall be carefully considered and planned, as it is costly, but also represents a great benefit. The implementation of an ISO standard has an impact on the entire work area concerned, including supporting departments for example responsible for personnel and finance. Before the establishment or further development of a QMS and the initiation of the accreditation project, a QM target agreement and the quality policy, shall be defined at management level. In addition to management approval of the accreditation project at a very early stage, all other departments that contribute to its success should always be involved, in addition to the relevant staff of the forensic team. It is also important to make the benefits of accreditation very clear from the outset to ensure acceptance by subsequent users.

Here, the following aspects should be mentioned again in concrete terms:

### General:

- formal proof of competence;
- formal proof of quality, reliability and traceability of results;
- increase in quality and safety of services and processes;
- confirmation that activities are competently performed in accordance with legal requirements and internationally applicable standards;
- proof that decisive factors such as competence and independence have been demonstrated in a neutral procedure;
- possibility of sustained qualitative development, optimisation of processes, reduction of errors and improvement of results;
- recognition of optimisation potential on a professional, technical and organisational level;
- minimisation of risks, since accreditation is based on legal requirements, internationally recognised norms and standards, and scientifically traceable methods;
- optimisation of customer satisfaction;
- strengthening of the confidence of the public, since accreditation is a recognisable mark of quality;
- improving harmonisation within national regulatory and legislative structures.

### Particular for crime scene work:

- possibility to achieve high quality standards in daily work;
- increase evidential value in criminal proceedings;
- increasing the importance of evidence recovery at the crime scene;
- strengthening the position of the organisation in court;
- improve management;
- facilitate the integration of new employees through precise description of work processes;
- simplify international exchange of results due to harmonisation of methods.

## 6.2 Project plan

Accreditation shall be well thought out and carefully prepared as part of a project. Even though the initiation and financing of the project will probably be at management level, all affected areas of an organisation should be involved in the planning and implementation. The tasks of the project manager and his or her team are very diverse and require numerous activities both in advance and during the actual accreditation process. In order to organise the individual work phases effectively, it is essential to draw up a project plan for the development, set-up, introduction and establishment. In principle, this is divided chronologically into two phases – the inventory and the implementation,

whereby the task lists of the subprojects shall be supplemented by corresponding schedules and the assignment of the respective responsibilities.

## 6.2.1 Inventory

During the inventory process, information is gathered that management can use to make a decision as to whether it is necessary and/or appropriate to have the area in question accredited. The individual steps are explained in the text below.

### 6.2.1.1 *Formation of a project team*

The project manager to be appointed by management should have experience in the area to be accredited (in this case, crime scene work), but should also already be familiar with QMSs. With the support of the management, the project manager puts together a suitable team, in which not only personnel from the crime scene work are involved, but also other important areas such as general quality management, education and training, personnel or finances are covered. The task of the project team is to plan and accompany the individual steps in the course of the inventory before the start of the actual accreditation process as well as during the implementation.

### 6.2.1.2 *Definition of the Scope of Accreditation*

Crime scene services can have all or parts of their activities accredited. In principle, the entire quality process starts with the response at the crime scene up to the moment when the evidence is part of the court proceedings. Here, it is necessary to define in advance exactly which areas are to be included and, in particular, which individual methods are to be considered, especially those whose results will later be documented in reports. The extent to which further processing in the forensics laboratory is included in the QMS for crime scene work shall also be clarified.

In addition, the following aspects shall also be considered:

- technical competence of the personnel including qualification, training and experience;
- concrete assignment of responsibilities and tasks;
- documentation of the investigation methods;
- use of appropriate equipment including its calibration and maintenance;
- code of conduct and processes concerning health and safety issues;
- effective quality assurance procedures.

### 6.2.1.3 *Standard Requirements*

Already at the beginning of the entire project, a decision should be made on the standard to which the intended accreditation is aligned. For crime scene work, this will usually be ISO/IEC 17020.

This standard defines numerous requirements, which altogether address the following aspects:

- general requirements (impartiality, independence, confidentiality);
- structural requirements (administration, organisation and management);
- resource requirements (personnel, facilities and equipment, subcontracting);
- process requirements (inspection procedures and procedural instructions, handling of items (evidence) and samples, reports, handling of complaints and appeals);
- management system requirements (including documentation, control of documents and records, management review, internal audits, preventive and corrective actions).

These requirements shall be carefully considered and applied to the scope of accreditation to ensure they are fulfilled and thus contribute to successful accreditation. Furthermore, additional official guidelines, other literature or even the advice of external specialists shall be included.

#### *6.2.1.4 Gap analysis and creation of a task list*

When a forensic service provider is considering accrediting the area of crime scene work, it is necessary to know where the organisation is currently. It is necessary to analyse whether there is still much that needs to be adapted to the desired QMS or, if so, whether most of the requirements of the chosen ISO standard are met.

A useful step to get an impression of which points in the organisation still need to be adapted is a so-called gap analysis. This involves reviewing the documentation and processes already in place within the forensic service provider to determine what should be changed or improved. This analysis includes processes and procedures for technical and management aspects, e.g. for sampling, method validation, use of equipment, staff qualification, etc., and leads to the creation of a task list that lists all measures necessary to meet the requirements of the accreditation standard.

#### *6.2.1.5 Costs/Financing*

The establishment and operation of a comprehensive QMS in accordance with the ISO standard and its accreditation, involves financial expenditure. This includes in particular costs, also indirect, for:

- accreditation procedures;
- upcoming surveillance assessments and re-accreditation;
- quality managers and employees assigned to them, external consultants if necessary;
- the time required by the employees of the organisational units, irrespective of their specific role in the process;
- monitoring activities, functional testing of equipment and documentation requirements;
- work equipment as well as additional equipment maintenance/calibrations;
- validation of methods;
- participation in proficiency tests/collaborative exercises;
- internal and external audits;
- education and training (courses, seminar and training costs);
- literature.

These costs have to be determined as precisely as possible in advance and have to be included in the budget of the authority in due time, of course in consultation with the management level responsible for the area concerned, in order to prevent the entire accreditation process from failing due to insufficient funding. Here, the support of the management is particularly required, because problems often arise precisely in the area of financing. Also, it is recommended to consult the NAB in order to make the estimated calculation.

#### *6.2.1.6 Decision and support by management*

After completion of the inventory, the project team makes a recommendation to the management, based on which a decision is made at management level on the further realisation of the planned accreditation.

#### *6.2.1.7 Contacting the accreditation body*

After the decision has been made in an organisation to apply for accreditation according to the relevant/appropriate standard (for the field of crime scene work, presumably ISO/IEC 17020), the person responsible for the project contacts an accreditation body in order to hold initial discussions that lay the foundations for the further path leading to the actual accreditation process.

Topics of an initial discussion may include, for example, the content, process and costs of the accreditation procedure, the scope of the accreditation, sought and rights and obligations between the organisation to be accredited and the accreditation body.

## **7. IMPLEMENTATION OF ACCREDITATION**

### **7.1 Application**

The actual accreditation process is initiated by submitting a written application. Application forms can usually be found on the websites of the accreditation body. The application shall contain the intended scope and be signed in a legally binding manner by the authorised representative of the authority to be accredited. Changes during the ongoing procedure are normally possible, but can lead to delays and are therefore not recommended.

By submitting the application, the applicant undertakes to provide the accreditation body with the information requested for the purpose of establishing competence, to approve the assessment procedures established by the accreditation body and to comply with the rules for accreditation.

After the application is submitted, the documents and data necessary for the preparation of the assessment shall be submitted. This includes the necessary guidelines/procedures, Quality Manual, Quality Policy Statement (policies and objectives), work instructions and applicable documents such as manuals, checklists, schemes, etc. The concrete planning of the assessment takes place only after the documents and data are available in full and have been checked with regard to their basic suitability and plausibility. If the review reveals significant deficiencies, corrections will be requested.

After a successful application review, the accreditation authority informs the applicant about the further procedure.

### **7.2 Assessment**

During the assessment phase, the accreditation body verifies the technical competence and the management system of the applying organisation, which includes in detail the verification of the qualifications of the personnel as well as the necessary equipment and the methods used.

#### **7.2.1 Preparation**

A prerequisite for a successful assessment is that the applicant organisation familiarises itself with the requirements of accreditation and clarifies that they are to be met or are already met.

In the run-up to the actual assessment, information can be obtained from the websites of the accreditation bodies, on the one hand, and on the other hand, the accreditation body can also provide advice directly on general questions of accreditation at any time.

Furthermore, it can be useful to arrange a preliminary visit with the accreditation body before the actual assessment, during which the suitability of the existing QMS, the documentation, the scope

of accreditation and personnel, equipment and other requirements are discussed, especially if the review of the documents after their submission to the accreditation body has revealed deficiencies that stand in the way of the actual on-site assessment. Such a preliminary assessment can also serve as a mutual exchange of information and clarification of open questions regarding the further accreditation process. In this context, the accreditation body itself may not provide a ready-made solution for implementation, but it can explain the accreditation procedure, the accreditation requirements and their interpretation.

For the actual assessment, the accreditation body selects and appoints a team with the appropriate expertise to cover the scope of accreditation of the applying organisation. In addition to the lead assessor, who is responsible for the assessment of the quality management system, among other things, the team usually includes one or more technical assessors or experts who are trained for assessment tasks for the specific scope of accreditation.

### 7.2.2 Actual Assessment

First, the assessors check the submitted documents for completeness and plausibility and determine the content, scope, timing and timeframe for the on-site visit. When planning the assessment, the scope of the accreditation area, any sites of interest for accreditation, and the most important activities are also considered. Based on this information, the program for the assessment is prepared.

The purpose of the assessment is to evaluate whether the organisation to be accredited meets the accreditation requirements for the scope of accreditation specified in the application. The review may include, but is not limited to, the following verification methods to manifest the competence of the organisation and the reliability of the results:

- document review;
- on-site assessment;
- witness assessment (observation and evaluation of activities in practice);
- interviews with management and other personnel;
- observation of work processes.

In terms of procedure, each stage of the actual assessment is divided into:

- introductory interview (explanation of purpose, underlying criteria and assessment plan);
- assessment (review of the processes described in the documentation with regard to their practical implementation);
- final discussion (presentation of the result of the assessment, the deviations found and the progress of the procedure, in particular with regard to the elimination of non-conformities).

After the assessment, a report is sent to the organisation, in which the observations made by the assessors during the assessment and the related conclusions are presented. The assessors comment here on the extent to which the assessed activities meet the requirements of accreditation and under what conditions the granting of accreditation is recommended.

Identified non-conformities including their classification (minor or major) are listed and their elimination is agreed upon within a restrictive timeframe.

### 7.2.3 Follow-up to the assessment

Deviations identified during the assessment can be remedied by the organisation requesting accreditation by taking appropriate corrective action within specified timeframes. After the

description of the corrective measures taken has been submitted, the assessment team evaluates whether the measures are appropriate and, if necessary, requests further additions. If necessary, another assessment visit takes place to check that the corrective measures are sufficient. Accreditation can only be granted when all identified deviations have been corrected in an appropriate manner.

### 7.3 Granting of accreditation

Finally, an accreditation committee evaluates the results of the assessment and decides on the granting of accreditation. If the accreditation body decides that the organisation complies with the relevant norms, standards or laws with regard to its conformity assessment activities and thus demonstrates its technical competence, the accreditation decision and certificate are issued, detailing the scope of accreditation. The organisation is included in a list of accredited bodies.

Should the accreditation not be granted or only partially granted, this will be stated with reasons in a corresponding notification.

### 7.4 Surveillance visits

The competence of an organisation is assessed through regular surveillance visits by the accreditation body after accreditation has been granted and before re-accreditation to ensure that the QMS is functioning effectively and the organisation working in the field of crime scene work continues to meet the respective accreditation requirements, maintains the standard of work and can be classified as competent. If deficiencies are identified during assessments, this may result in the restriction, suspension, or withdrawal of accreditation (see Section 7.6).

The preparation, implementation and follow-up of the surveillance visits are analogous to the procedure for the assessment in the actual accreditation process. After completion of the assessment, the forensic service provider receives a confirmation from the accreditation body that the accreditation is maintained, unless the outcome of the assessment leads to a restriction of the accredited area, which is documented by a corresponding notice.

Regular monitoring measures are required by a forensic service provider during the accreditation cycle, e.g.:

- internal audits (including checking all documents for up-to-datedness and correctness of content);
- on-site inspections;
- remote assessments, if on-site visits are not possible;
- witness audits and witness reviews;
- preparation of an annual report (including statistics, information about problems encountered and description of goals for the next year);
- feedback system (internal system for complaints and improvements).

### 7.5 Change of accreditation scope and re-accreditation

#### 7.5.1 Change of accreditation scope

The most significant change in accreditation is the extension of the scope of accreditation. A change of the accredited scope is carried out only upon request. Changes can be carried out both within the framework of a scheduled assessment and independently of it in terms of time. An application

for a change within the scope of accreditation should be submitted to the accreditation body in due time. The procedure is generally the same as described in the actual assessment.

Reduction of the scope of an accreditation can also be applied for, of course, if it seems necessary or reasonable. Extensions and changes to the scope of accreditation are confirmed by an amendment to the accreditation decision.

#### 7.5.2 Re-accreditation

Since an accreditation is granted for a limited period of time, a corresponding application for re-accreditation shall be submitted to the accreditation body, usually in the last year of the validity of the accreditation decision. The procedure here also corresponds in principle to the procedures already described for the assessment, but the coverage of the scope will be done on a risk-based and planned basis during the accreditation period. This may also take into account the knowledge gained about the subject of the assessment during the period.

During re-accreditation, it is ensured that all requirements of the respective requirement standard are fulfilled and it is checked whether competence in all sub-areas of technical operation has been comprehensively demonstrated. The assessment for re-accreditation is based on documents provided to the assessors in advance, information obtained during previous assessments of the organisation (including, in particular, the last periodic assessment review of the current accreditation period), on-site observations, interviews, and monitoring of the organisation, and is equivalent in scope and thoroughness to the initial assessment.

#### 7.6 Suspension, restriction or withdrawal of an accreditation

If the accreditation body determines on the basis of its own findings or from third party notifications that a forensic service provider is either no longer competent or has seriously violated its duty, it shall take measures to suspend, restrict or withdraw the accreditation concerned.

This can happen in particular if the forensic service provider concerned repeatedly or seriously violates standard requirements, essential accreditation requirements, e.g. in the areas of personnel, facilities or premises, are omitted, the accreditation body is deliberately deceived by the transmission of false or incomplete information essential for the assessment, or requirements are not fulfilled after a grace period has been set.

After clarification of the facts, whereby the forensic service provider concerned is obliged to cooperate to the necessary extent, the latter is usually heard and given the opportunity to comment.

If required corrective measures to remedy identified deficiencies are not fulfilled within a specified period of time or are insufficiently fulfilled, this may result in the following measures within the scope of responsibility of the accreditation body:

- suspension (temporary restriction of accreditation, either completely or for a part of the scope of accreditation);
- restriction (withdrawal of a part of the scope of accreditation);
- withdrawal (withdrawal of an accreditation for the entire scope).

Provided that an accreditation is only partially suspended or limited, an updated accreditation certificate is issued and the forensic service provider's entry in the database of accredited bodies is adjusted or deleted accordingly.



During temporary suspension or in the revoked scope of accreditation, the forensic service provider shall not issue documents as an accredited body. During the suspension, it has the opportunity to demonstrate compliance with the accreditation requirements, whereupon accreditation may be restored, usually after an on-site assessment by the accreditation body. Accreditation is withdrawn if, after suspension, it is determined that accreditation requirements are still not met.

## 8. REFERENCES

This section lists publications referenced in this document.

### STANDARDS

- [1] EN ISO/IEC 17020:2012, *Conformity assessment – Requirements for the operation of various types of bodies performing inspection*
- [2] EN ISO/IEC 17025:2017, *General requirements for the competence of testing and calibration laboratories*
- [3] ISO/IEC 17000:2020, *Conformity assessment – Vocabulary and general principles*
- [4] ISO 21043-1:2018, *Forensic Sciences. Part 1: Terms and definitions*
- [5] ISO 21043-2:2018, *Forensic sciences – Part 2: Recognition, recording, collecting, transport and storage of items*
- [6] ISO 9000:2015, *Quality management systems – Fundamentals and vocabulary*
- [7] EN ISO 9001:2015, *Quality management systems – Requirements*
- [8] EN ISO 19011:2018, *Guidelines for auditing management systems*
- [9] ISO 31000:2018, *Risk Management Guidelines*
- [10] ISO/IEC 17043:2010, *Conformity assessment – General requirements for proficiency testing*
- [11] ISO 18385:2016 *Minimizing the risk of human DNA contamination in products used to collect, store and analyse biological material for forensic purposes – Requirements*

### ILAC DOCUMENTS

- [12] ILAC P9:06/2014, *ILAC Policy for Participation in Proficiency Testing Activities*
- [13] ILAC P10:07/2020, *ILAC Policy on Metrological Traceability of Measurement Results*
- [14] ILAC P15:05/2020, *Application of ISO/IEC 17020:2012 for the Accreditation of Inspection Bodies*
- [15] ILAC G19:06/2022, *Modules in a Forensic Science Process*
- [16] ILAC G24:2022, *Guidelines for determination of recalibration intervals of measuring equipment*
- [17] ILAC G27:07/2019, *Guidance on measurements performed as part of an inspection process*

### ENFSI DOCUMENTS

- [18] ENFSI BRD-ACR-001, 2019, *Policy on Accreditation*
- [19] ENFSI BRD-GEN-003, 2005, *Code of Conduct*
- [20] ENFSI BPM-SOC-01, 2022, *Best Practice Manual for Scene of Crime Examination*
- [21] ENFSI QCC-CAP-003, 2004, *Performance Based Standards for Forensic Science Practitioners*
- [22] ENFSI QCC-PT-001, 2014, *Guidance on the Conduct of PT and CE within ENFSI*
- [23] ENFSI QCC-VAL-002, 2014, *Guidelines for the single laboratory. Validation of Instrumental and Human Based Methods in Forensic Science*

### ACCREDITATION BODY'S DOCUMENTS

- [24] *Accreditation of Bodies Carrying out Scene of Crime Examination*, RG201, UKAS, 2015
- [25] *ISO/IEC 17020 Accreditation Requirements for Forensic Inspection Bodies*, ANAB, MA 3012, 2015
- [26] *EA-4/18 G: 2021 Guidance on the level and frequency of proficiency testing participation*

**OTHER DOCUMENTS**

- [27] *NATA Specific Accreditation Guidance - Calibration Reference Equipment*, 2020
- [28] *Guide to Quality in Analytical chemistry. An aid to Accreditation*, Eurachem/CITAC Guide, 2016
- [29] *PAS 377 Specification for consumables used in the collection, preservation and processing of material for forensic analysis - Requirement for product, manufacturing and forensic kit assembly*, 2012

## **9. AMENDMENTS TO PREVIOUS VERSION**

Not applicable (first version).

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## APPENDIX A: GLOSSARY

**Accreditation:** Accreditation is the formal, internationally accepted recognition by an authoritative body of the facilities, capability, objectivity, competence, and integrity of an agency, service, or operational group or individual to provide the specific service or operation needed. The term has multiple meanings depending on the sector. [OSAC FSSB QTG <https://lexicon.forensicosac.org/>, last revision date 23/2/2018]

**Accredited inspection body:** An organization that performs examinations and/or inspections of materials, products, installations, plants, processes, work procedures or services, where examination activities are evaluative and not considered testing, and that has received formal recognition by an accrediting body that it meets or exceeds a list of standards to perform specific inspections/examinations. [OSAC FSSB QTG modified from ISO/IEC 17020:2012 <https://lexicon.forensicosac.org/>, last revision date 23/2/2018]

**Accrediting body:** An authoritative body that performs accreditation. The authority of an accreditation/accrediting body is generally derived from government, national, or international standards. [ISO/IEC 17000:2020]

**Appeal:** A request by the provider of the item of inspection to the inspection body for reconsideration by that body of a decision it has made relating to that item. [ISO/IEC 17020:2012]

**Assessment:** Process undertaken by an accreditation body to evaluate the conformity, competence and effectiveness of a laboratory based on particular standard(s) and/or other normative documents and for a defined scope of accreditation. [Forensic Toxicology <https://lexicon.forensicosac.org/>, last revision date 11/4/2019]

**Audit:** A systematic, independent and documented process for obtaining audit evidence and evaluating it objectively to determine the extent to which audit criteria are fulfilled. [ISO 9000:2015]

**Audit team:** One or more auditors conducting an audit, supported if needed by technical experts. [ISO/IEC 9000:2015]

**Calibration:** Operation that, under specified conditions, in a first step, establishes a relation between the quantity values with measurement uncertainties provided by measurement standards and corresponding indications with associated measurement uncertainties and, in a second step, uses this information to establish a relation for obtaining a measurement result from an indication. [International Vocabulary of Basic and General Terms Metrology: 1993 6-11 and ISO/IEC Guide 99:2007]

**Chain of custody:** Chronological record of the handling and storage of an item from its point of collection to its final return or disposal. [ISO 21043-1:2018]

**Collaborative exercises (CEs):** These are interlaboratory comparisons that are designed to address specific issues such as troubleshooting, method validation or characterization of reference materials. CEs are not designed to monitor laboratory performance of analysis or interpretation, but CEs may include monitoring of laboratory performance and/or interpretation. [ENFSI QCC-PT-001:2014]

**Complaint:** An expression of dissatisfaction, other than appeal, by any person or organisation to an inspection body, relating to the activities of that body, where a response is expected. [ISO/IEC 17020:2012]

**Competence:** The ability to perform the task of a certain role by virtue of their training and/or experience and demonstrated knowledge, skills and abilities. [ENFSI BPM-SOC-01:2022]

**Conformity/nonconformity:** Fulfilment of a requirement/non-fulfilment of a requirement. [ISO 9000:2015]

**Examination strategy:** Plan developed to specify the requirements and activities for the examination phase of a forensic process. [ISO 21043-1:2018]

**Forensic:** Related to methods, techniques and processes used to establish conclusions and/or opinions, facts and findings, which can be used for legal proceedings. [ISO 21043-1:2018]

**Forensic inspection:** Examination of a person, item, or location and, on the basis of professional judgement, the determination of their conformity with proposed events or known conditions. [ANAB ISO/IEC 17020 Accreditation requirements for forensic inspection bodies, MA 3012, 2015]

**Forensic process:** Gathering, evaluation, and assessment of all types of evidence using scientific procedures, as well as the location, documentation, and preservation of evidence. [ANAB ISO/IEC 17020 Accreditation requirements for forensic inspection bodies, MA 3012, 2015]

**Forensic service provider:** Organisation or individual that conducts and/or supplies forensic services. [ISO 21043-1:2018]

**Forensic unit:** A legal entity or a defined part of legal entity that performs any part of the forensic science process. [ILAC G19:2022]

**Impartiality:** Objectivity, neutrality and fairness along with the awareness of bias and reduction of prejudice. [ISO 21043-1:2018]

**Independence:** Freedom of a person or organization from the control or authority of another person or organization. [ISO/IEC 17000:2020]

**Inspection:** Examination of a product, process, service, or installation or their design and determination of its conformity with specific requirements or, on the basis of professional judgment, with general requirements. [ISO/IEC 17020:2012]

**Inspection body:** Forensic unit or agency such as crime scene investigation agency using professional judgement to examine (inspect) a scene with the aim of contributing to determining what happened, where it happened, when it happened, how it happened, why it happened, and who was involved. [ANAB ISO/IEC 17020 Accreditation requirements for forensic inspection bodies, MA 3012, 2015]

**Interpretation:** Use of professional judgement to provide conclusions and/or opinions on hypotheses, based on findings and information gathered through the forensic process. [ISO 21043-1:2018]

**Item:** Object, substance or material that is collected, derived or sampled as part of the forensic process. [ISO 21043-1:2018]

**Management system (MS):** A set of interrelated or interacting elements of an organization to establish policies and objectives, and processes to achieve those objectives. [ISO 9000:2015]

**Management/Case Review:** A review of the case file and report, in each case, to ensure that the customer's needs have been properly addressed, compliance with laboratory policy and, for the report, editorial correctness. [ENFSI BPM-SOC-01:2022]

**Measurement traceability:** Traceability is a process whereby the indication of a measuring instrument (or material measure) can be compared with a national standard for the measurand in question in one or more stages. [ANAB ISO/IEC 17020 Accreditation requirements for forensic inspection bodies, MA 3012, 2015]

**Metrological characteristic:** Characteristic which can influence the results of measurement. Measuring equipment usually has several metrological characteristics. Metrological characteristics can be the subject of calibration. [ISO 9000:2015]

**Metrological traceability:** Property of a measurement result whereby the results can be related to a reference through a documented unbroken chain of calibrations, each contributing to the measurement uncertainty. [OIML International Vocabulary of Metrology - Basic and General Concepts and Associated Terms 3rd Edition 2007 (item 2.41) [https://www.oiml.org/en/files/pdf\\_v/v002-200-e07.pdf](https://www.oiml.org/en/files/pdf_v/v002-200-e07.pdf)]

**Peer review:** Evaluation of the reports, examinations, notes, data and findings by others competent in the same field to assess that there is an appropriate and sufficient basis for the conclusions and/or opinions. [ISO 21043-1:2018]

**Proficiency Tests (PT):** Evaluation of participant performance against pre-established criteria by means of interlaboratory comparisons. [ILAC P9:2014]

**Quality Assurance (QA):** Part of quality management, planned and systematic actions, focused on providing confidence that quality requirements will be fulfilled. QA is the process of managing for quality; set of processes to ensure great quality. [ISO 9000:2015]

**Quality Control (QC):** Part of quality management focused on fulfilling quality requirements. QC is used to verify the quality of the output; quality-check procedures. [ISO 9000:2015]

**Quality Management (QM):** Coordinated activities to direct and control an organization with regard to quality. Quality management can include establishing quality policies and quality objectives, and processes to achieve these quality objectives through quality planning, quality assurance, quality control, and quality improvement. [ISO 9000:2015]

**Quality Management System (QMS):** Part of a management system with regard to quality. Described procedures of organization activities which contribute to quality, directly or indirectly: organizational structure, responsibilities, procedures, processes and resources for implementing quality management. [ISO 9000:2015]

**Standard Operation Procedure (SOP):** Authorized, documented specified way to carry out an activity or process. [ISO 21043-1:2018]

**Validation:** A systematic process used to create objective evidence which demonstrates that a method or procedure provides the correct outcome and fulfils the particular requirements as defined by the intended use. [IFSA 2014 Minimum requirements for crime scene investigation]

**Verification:** Where the techniques or procedures adopted have been validated elsewhere, the organization is required to carry out a verification exercise to demonstrate that it can achieve the same quality of results in its own environment. [ENFSI BPM-SOC-01:2022]

<b>Organisational Acronyms/abbreviations</b>	
<b>ANAB</b>	ANSI National Accreditation Board (North America)
<b>CEN</b>	European Committee for Standardization
<b>EA</b>	European co-operation for Accreditation
<b>EFSA</b>	European Forensic Science Area
<b>ENFSI</b>	European Network of Forensic Science Institutes
<b>IEC</b>	International Electrotechnical Commission
<b>IFSA</b>	International Forensic Strategic Alliance
<b>ILAC</b>	International Laboratory Accreditation Cooperation
<b>ISO</b>	International Organization for Standardization
<b>NAB</b>	National Accreditation Body
<b>OSAC</b>	Organization of Scientific Area Committees for Forensic Science
<b>UKAS</b>	National Accreditation Body for the United Kingdom

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