Forensic Science Regulator

Code of Practice

Consultation Draft 08.08.2022

This draft of the Code of Practice is produced in line with the provisions of Section 2 of the Forensic Science Regulator Act 2021 and to provide the basis for consultation required under Section 3. Changes may be made to this draft consequent on the consultation.

The Forensic Science Regulator Act 2021

This is the Code of Practice issued by the Forensic Science Regulator pursuant to the provisions of s2 of The Forensic Science Regulator Act 2021.

In accordance with the provisions of the Act this Code has been:

1. Prepared and published by the Forensic Science Regulator [as required by s2];
2. Approved by the Secretary of State [as required by s3(3)(b)] on [Date to be inserted];
3. Laid before Parliament by the Secretary of State [as required by s3(3)(b)] on [Date to be inserted];
4. Approved by the House of Commons [as required by s3(3)(c)] on [Date to be inserted]; and
5. Approved by the House of Lords [as required by s3(3)(c)] on [Date to be inserted].

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Introduction

1. Introduction

1.1 General

1.1.1 Forensic science is a critical and important part of criminal investigations and the administration of justice, not only to identify offenders and provide expert evidence to the courts, but it is one of the strongest safeguards against false allegation and wrongful conviction. Forensic science examinations carry significant risks, and the consequences of a quality failure can be profound, particularly where there is a system rather than an individual failure. The former could lead to the review of hundreds or even thousands of results generated by a flawed technique or method. The aim of forensic science regulation is to ensure that accurate and reliable scientific evidence is used in criminal investigations, in criminal trials, and to minimise the risk of a quality failure.

1.1.2 The model for regulation of forensic science in England and Wales is based on each forensic unit implementing and operating an effective quality management system that meets the requirements of this Code. This will provide the necessary control of processes and minimise the risk of quality failure.

1.1.3 An effective quality management system allows forensic units to understand and manage the risk of quality failure and recover from quality failure. The key elements of a quality management system are:

a. Validation of methods;

b. Defining, demonstrating and testing the initial and ongoing competence of practitioners;

c. Having documented and controlled procedures, and an internal audit process to ensure they are effective and being followed;

d. Commitment from senior leadership, including making available sufficient resources (see section 16.2); and

e. Enabling continuous improvement.

1.1.4 The establishment of an effective quality management system provides the basis for forensic units to produce reliable results and understand and manage the risk of a quality failure. Quality management systems in forensic units in the UK are, where accreditation is required, assessed by the United Kingdom Accreditation Service ® (UKAS ®) [1] against international standards[2] and guidance, primarily BS EN ISO/IEC 17025:2017 [1], BS EN ISO/IEC 17020:2012 [2], and ILAC G19:06/2022 [3]. Similar provisions will apply with other accreditation bodies.

1.1.5 The role of the non-statutory Forensic Science Regulator was established in 2007 [3] under the Royal Prerogative to set standards for forensic science and ensure compliance with those standards. This was achieved through the establishment of the Codes of Practice and Conduct [4], appendices covering different sectors of forensic science, and general guidance documents. In 2011 [5] the House of Commons Science and Technology Select Committee called for the Forensic Science Regulator to be given statutory powers, it reinforced this in two further reports [6] [7] and the House of Lords Science and Technology Select Committee also called for statutory powers [8]. A Private Members Bill [9] to establish statutory powers for the Forensic Science Regulator was introduced in Parliament in 2020 and, following modification, the Forensic Science Regulator Act 2021 (the '2021 Act') [10] received Royal Assent on 29 April 2021 [11]. [4]

1.1.6 The role of the Forensic Science Regulator (the 'Regulator') under the 2021 Act was introduced on 25 July 2022 [12].

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1 The terms 'United Kingdom Accreditation Service' and 'UKAS' are registered trademarks of the United Kingdom Accreditation Service which is the national accreditation body for the United Kingdom.

2 International standards are referred to by full title when first mentioned in this Code, following which the convention has been adopted to use a shorthand to refer to the international standard. For example, 'ISO 17025' rather than BS EN ISO/IEC 17025:2017.

3 Written Ministerial Statement of 12 July 2007 by Meg Hillier MP (then a Minister at the Home Office). [13]

4 On Royal Assent certain administrative provisions of the 2021 Act became law. All other provisions of the 2021 Act were to be brought into effect by Regulations issued by the Secretary of State [see s13 2021 Act [10]].

1.2 The Forensic Science Regulator Act 2021

1.2.1 The 2021 Act [10] requires the Regulator to prepare and publish a code of practice about the carrying on of forensic science activities (FSAs) in England and Wales. This document is the Code of Practice (the 'Code') required by Section 2 of the 2021 Act [10]. This Code builds on the non-statutory Codes of Practice and Conduct [4] incorporating much of their content.

1.2.2 The 2021 Act [10] introduced powers for the Regulator to intervene where they have reason to believe or believe that a person [5] may be undertaking a forensic science activity to which this Code applies in a way that creates a substantial risk (that being a risk which is more than theoretical) [6] of:

a. Adversely affecting any investigation; or

b. Impeding or prejudicing the course of justice in any proceedings. [7]

1.2.3 The powers introduced include one to investigate [see s5 2021 Act [10]] and one to require compliance [see s6 2021 Act [10]].

1.2.4 The 2021 Act [10] makes further provision for the Regulator to require persons to provide copies of documents and other information in the person's possession or control as part of a Regulator's investigation.

1.2.5 Every effort should be made by all those who work in forensic science to avoid the situation arising where there is an unacceptable risk to an investigation or the administration of justice. The Senior Accountable Individual (see section 16) shall be accountable for compliance with the Code and the monitoring and mitigation of the risk of quality failures.

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5 The term 'persons' is defined in The Interpretation Act 1978 [15] and that definition includes any 'body of persons corporate or unincorporate'.

6 The term 'substantial risk' in the 2021 Act [10] has not yet been considered by the courts. The term is used in the Contempt of Court Act 1981 [140] and the meaning has been considered by the courts in that context. See, for example, Her Majesty's Attorney General v. Express Newspapers [2004] EWHC 2859 (Admin).

7 Neither the investigations nor proceedings are limited to those in the Criminal Justice System in England and Wales.

1.3 The Code

1.3.1 This Code is based on the regulatory model historically (i.e. prior to the introduction of the 2021 Act [10]) in use for forensic science in England and Wales in that it requires each forensic unit to operate an effective quality management system and, where required by this Code, achieve and maintain accreditation to a suitable international standard and include compliance with this Code in the schedule of accreditation. Also included in this Code are additions to cover the provisions set out in the 2021 Act [10] including Regulator's investigations, issuing of compliance notices, issuing completion certificates, appeals and other functions of the Regulator. [8]

1.3.2 This Code applies to all those undertaking FSAs subject to this Code, whether individual practitioners, academics, public or private sector or forensic science units. These can be small teams in larger organisations, sole practitioners or large providers and can be commissioned by the prosecution or the defence.

1.3.3 This Code applies to FSAs undertaken for matters related to the Criminal Justice System (CJS) in England and Wales. Future versions of the Code can be applied to other jurisdictions and/or purposes by order of the Secretary of State [see s11(2)(c) of the 2021 Act [10].

1.3.4 This Code is not intended to be a substitute for the complete version of the international standards referred to. Section 110 of this Code cross references to the key clauses that appear in the normative references (see section 11.2); this is not intended to be a comprehensive analysis of the provisions. Forensic units applying for, or holding, accreditation to one, or more, of the international standards (issued by the International Organization for Standardization) remain responsible for ensuring they are aware of all relevant requirements within, or related to, those standards.

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[8] The coverage of these issues in this Code is limited to what is needed to understand the operation of this Code. These matters are dealt with, in more detail, in relevant policy documents issued by the Regulator.

2. Structure

2.1.1 This document is formed of several parts as set out below.

a. Part A - Legal Position - Sets out the legal background to this Code.

b. Part B - Summary of Requirements - Provides a summary of the requirements established for each FSA.

c. Part C - The Code – Sets out legal issues related to this Code.

d. Part D - Standards of Conduct- Sets out the standards of conduct.

e. Part E - Standards of Practice - Sets out the standards of practice.

f. Part F – Appendices - Contains appendices to this Code. These may contain, inter alia, the following.

i. Information about specific issues.

ii. Definitions of FSAs.

iii. Standards and requirements which are relevant to a specific FSA or groups of FSAs.

iv. The means of demonstrating compliance with this Code relevant to a specific FSA or group of FSAs.

g. Part G - General Information - Contains information which is general to this Code.

Part A - Legal Position

3. The Forensic Science Regulator

3.1.1 The 2021 Act [10] placed the Regulator on a statutory basis (as a new legal entity) and provided the Regulator with legal powers. Those include, but are not limited to, the power to:

a. Issue a code of practice;

b. Issue guidance and/or advice;

c. Investigate concerns; and

d. Protect the CJS from poor practice in forensic science.

3.1.2 While the 2021 Act [10] makes no reference to 'quality' or 'standards' the Written Ministerial Statement, in 2007 [13], made clear that the role of the Regulator related to quality standards in forensic science. The explanatory memorandum [14] which accompanied the bill (which became the 2021 Act [10]) and the Parliamentary debates [9] on the bill were clear that the main aim of the bill was to transfer the then existing role to a statutory basis and provide additional powers.

3.1.3 The role of the Regulator therefore focusses on quality standards in forensic science as opposed to any other aspect of the provision of forensic science.

3.1.4 The Regulator establishes the quality standards which must be implemented and maintained by those undertaking FSA in England and Wales. These standards are often developed in partnership with a specialist group including, but not limited to, technical experts, representatives of those that commission the work, United Kingdom Accreditation Service, professional/regulatory bodies,

[9] The debates on the bill were as follows. In the House of Commons - the first reading [171], the second reading [170], the money resolution [165], the committee stage [166] and the third reading [164]. In the House of Lords – the first reading [167], the second reading [168], the committee stage [172] and the third reading [169]. Royal Assent was recorded on the 29th April 2021 [11].

and key stakeholders in the CJS. These standards are set out in the code of practice issued under s2 of the 2021 Act [10].

3.1.5 The Regulator may also provide guidance in relation to undertaking FSAs (whether covered by this Code or not) in England and Wales. While such guidance is often produced in a similar manner to standards it is not published in the code of practice. The guidance may advise forensic units on how to achieve and maintain the requirements set out in the code. Non-compliance with guidance does not, by itself, establish non-compliance with the code but any forensic unit which does not comply with guidance (e.g. chooses another approach to achieving requirements) shall be capable of showing how the requirements of the code have been met.

4. Basis of Appointment of the Forensic Science Regulator and Legal Powers

4.1.1 Those sections of the 2021 Act [10] which did not become effective on Royal Assent [see s13 of the 2021 Act [10]] were brought into effect by Regulations issued by the Secretary of State [see s13(4) of the 2021 Act [10]]. Those Regulations are as follows.

a. The Forensic Science Regulator Act 2021 (Commencement No. 1 and Transitional Provision) Regulations 2022 [12] brought sections 1, 2, 3, 4, 5, 9, and 12 into effect on 25 July 2022.

b. ### brought sections ### into effect on ###.

5. Forensic Science Activities

5.1 Legal Basis

5.1.1 The approach taken in the 2021 Act [10] [see s11] was to establish the concept of ‘forensic science activity’ (FSA). The definition adopted was, deliberately, one which could cover anything which might conceivably be considered forensic science. The 2021 Act [10] [see s2] requires that the Regulator defines the FSAs which are subject to the code. This places responsibility on the Regulator for defining, with sufficient clarity, what activities are FSAs subject to the code.

5.2 Definition

5.2.1 Section 11 of the 2021 Act [10] defines FSA as follows.

(1) In this Act “forensic science activity” means an activity relating to the application of scientific methods for a purpose mentioned in subsection (2).

(2) Those purposes are—

(a) purposes relating to the detection or investigation of crime in England and Wales;

(b) purposes relating to the preparation, analysis or presentation of evidence in criminal proceedings in England and Wales;

(c) such other purposes as the Secretary of State may specify in regulations made by statutory instrument.

5.2.2 At the time of publication of the first issue of this Code no regulations have been issued under the provisions of s11(2)(c).

5.2.3 The s11 definition is clearly a wide one which could cover a significant range of activities.

5.3 Limits on FSA

Link to Crime

5.3.1 The definition of FSA in 5.2.1 makes clear that FSA must be undertaken for one of the purposes set out in s11(2) 2021 Act [10].

5.3.2 The definition refers to ‘crime’ rather than a specific crime so that the work does not have to be related to a specific offence or suspected offence.

5.3.3 The 2021 Act [10] uses the text ‘relating to’ which indicates the work does not have to be directly for the purposes stated.

Territorial Extent

5.3.4 The 2021 Act [10] imposes territorial restrictions. These are discussed in section 7 of this Code.

Approach

5.3.5 The general requirements for FSAs (see section 42) are intended to give effect to the limitations set out above.

5.4 Levels

5.4.1 The 2021 Act [10] provides, see s2, that the Regulator shall issue a Code of Practice and, in that code, shall define which FSAs are subject to the Code. The Regulator's powers to investigate [see s5 2021 Act [10]] and issue compliance notices [see s6 2021 Act [10]] apply only to FSAs which are subject to the code.

5.4.2 In contrast, the Regulator's powers to provide guidance [see s9(1) 2021 Act [10]] and provide advice [see s9(2) 2021 Act [10]] are available in relation to all FSA undertaken in England and Wales.

5.4.3 This means that the Regulator can define activities which might be considered forensic science (or some related field or undertaking) into levels as follows.

a. Activities which are not FSA.

b. Activities which are FSA, but which are not subject to the code.

c. Activities which are FSA and are subject to the code.

5.4.4 The Regulator can set different requirements for different FSA [see s2(2)(c) of the 2021 Act [10]].

5.4.5 The Regulator has no direct role in respect of those activities which are defined not to be FSA.

5.5 Approach to FSA Definition

5.5.1 The 2021 Act [10], see s2(2)(a), requires that the code sets out which FSAs are subject to the provisions of the code. The primary purpose of the definition of FSAs in this Code is to satisfy that requirement. It follows that, in relation to any issue of the code:

a. A declaration that an activity is an FSA subject to the code is conclusive; and

b. A declaration that an FSA is not subject to the code is conclusive.

5.5.2 The FSAs covered, and not covered, by the code may be different in future issues of the code.

5.5.3 Where an activity is not defined as an FSA in the code this is not conclusive as to the issue. Only a clear statement by the Regulator, in the code, or by regulatory notice, will achieve this.

5.5.4 To ensure it is clear what is covered, and which standards apply for each FSA, the definitions may include exclusions. In some cases, these exclusions will make clear that activities which are not considered FSA are excluded from a particular definition. There are several aspects of the definition of FSAs which will be common across all, or most, definitions.

5.5.5 Section 42 and Section 44 of this Code sets out these general provisions and requirements which apply to all FSA definitions unless clear language to the contrary is included in a specific FSA definition.

5.6 Scope of FSA

5.6.1 A forensic unit which undertakes any part of an FSA is undertaking that FSA.

5.6.2 In general, a forensic unit which is carrying on an FSA is not required to deliver every aspect of the description of the FSA.

5.7 Restrictions

5.7.1 The definition of FSA in the 2021 Act [10] is, deliberately, wide enough to cover most areas where scientific methods [10] are used in the CJS. In defining the FSAs which are subject to this Code the Regulator has focussed on those FSAs which have historically been considered forensic science.

5.7.2 In future editions of this Code the scope of activities which are covered by the code may expand.

5.8 Significance

5.8.1 The purpose of defining activities as FSAs is to delineate the remit of the Regulator. It is not intended, by itself, to make any comment on the nature or value of any activity (whether defined as an FSA or not).

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10 The text in the 2021 Act [10] refers to ‘scientific methods’ as opposed to ‘scientific method’. The text of the Act is more general than any generally accepted definition of ‘scientific method’.

6. The Code

6.1 General

6.1.1 Section 2 of the 2021 Act [10] requires the Regulator to “prepare and publish a code of practice about the carrying on of forensic science activities in England and Wales”.

6.2 Limits on the Code

6.2.1 The 2021 Act [10] imposes territorial restrictions. These are discussed in section 7.

6.3 Changes to the Code

6.3.1 This Code has, or in time will, replace the Codes of Practice and Conduct [4] issued by the non-statutory Forensic Science Regulator. This Code will change over time. The process by which this will occur is discussed in section 12.

6.3.2 It is inevitable that there will be circumstances where the work on an individual case will occur over a timescale in which more than one issue of the code is in force.

6.3.3 All work should be performed in accordance with the Code which is in effect at the time the work was undertaken. There is no requirement to revisit work which has already been completed if this Code changes except where a quality issue has been reported. [11]

7. Territorial Extent

7.1 General

7.1.1 The 2021 Act [10] imposes restrictions on the territorial application of its provisions in three ways. [12]

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11 Where a change in the code will not require a review of any work undertaken when a previous issue was in force the response to a quality issue may require such a review.

12 The provisions of sections 5, 6 and 9 of the 2021 Act [10] are subject to territorial restrictions which are based on the provisions discussed in this section.

a. There are restrictions on the nature of FSAs [see s11 of the 2021 Act [10]].

b. There are restrictions on the application of the Code [see s2 of the 2021 Act [10]

c. There are restrictions on the application of the Act [see s13 of the 2021 Act [10]].

7.1.2 It is important to be clear that these are separate restrictions as they apply in different ways to different provisions of the 2021 Act [10]. To understand the operation of the Code it is necessary to appreciate all of these provisions and the manner in which they interact.

7.1.3 The restrictions on the FSA and Code are discussed below.

7.2 Forensic Science Activities

7.2.1 The 2021 Act [10] creates a territorial limit to the scope of FSA by reference to ‘England and Wales’.

7.2.2 The terms ‘England’ and ‘Wales’ are defined in The Interpretation Act 1978 [15].

7.2.3 In relation to s11(2)(a) of the 2021 Act [10] the limit is taken to mean that the work must relate to crime in England and Wales. s11(2)(a) of the 2021 Act [10] imposes no restriction on where the FSA may be undertaken (however, see 7.3.1).

7.2.4 In relation to s11(2)(b) of the 2021 Act [10] the limit is taken to mean the criminal proceedings must occur in England and Wales. It imposes no restriction on:

a. Where the crime, or suspected crime, occurred; or

b. Where the FSA is undertaken.

7.3 The Code

7.3.1 The provisions of s2 of the 2021 Act [10] mean that this Code only applies to FSAs which are undertaken in England and Wales.

7.3.2 An FSA will, subject to the point in section 7.3.3, be undertaken within England and Wales if the activity occurs within the areas covered in those definitions.

7.3.3 The following activities shall always be considered to occur in England and Wales regardless of the location of the forensic unit:

a. The reporting of the outcome of any activities; and/or

b. The provision of evidence (whether written or oral).

7.3.4 Any person reporting on the outcome of forensic science activities, or providing evidence, in England and Wales is subject to guidance issued by the Regulator in relation to the carrying on of forensic science activities regardless of the location of the forensic unit.

8. International Obligations

8.1 Forensic Service Providers Regulations

8.1.1 The Accreditation of Forensic Service Providers Regulations 2018 [16] create requirements related to the use of providers accredited to EN ISO/IEC 17025 [1] in certain areas of forensic science. Whilst this Code and the Regulations [16] establish a requirement, in certain circumstances, for accreditation the Regulations [16] are separate from the work of the Regulator.

8.1.2 This Code is not related to the operation of the Regulations [16] and nothing in this Code should be taken to be of any significance in relation to the operation of the Regulations [16].

8.1.3 The Regulations [16] are of no significance to the operation of this Code. Nothing in the Regulations [16] affect the operation of this Code. In particular, the provisions in regulation 4(2A) do not apply where a requirement for accreditation is created by this Code[13].

8.1.4 In all cases where this Code requires accreditation, the accreditation must be through the normal route employed by the accreditation body involved.

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13 This means that the fact a person from an accredited entity (other than the forensic unit at which the activity is being undertaken) performs, or supervises, the relevant work does not equate to having accreditation for the purposes of this Code.

8.2 Future Obligations

8.2.1 Where HM Government has determined that the United Kingdom (or any part thereof) should comply with international agreements, or treaties, which relate to the quality of forensic science these may be reflected in future issues of the code.

Part B - Summary of Requirements

9. Overview of FSAs and Requirements

9.1.1 This section provides a summary of the requirements set out in the definition for each FSA (see Part F – Appendices). This is a summary and, in the event of any inconsistencies with the content of the FSA definitions, the FSA definitions shall prevail.

Forensic Science Activity	Summary of Requirements
Incident Scene Examination (Section 46)	Compliance with the Code from the effective date of the Code. Accreditation to ISO 17020 from the effective date of the Code (for the sub-activities the organisation undertakes which are required to be on the accreditation scope). Within 24 months of the effective date of the Code the organisation must demonstrate compliance with the Code by having a schedule of accreditation that includes the Code and reflects all FSAs (or parts thereof) that the organisation undertakes.
Examination of Incidents involving Vehicles (Section 84)	This FSA is not subject to this version of this Code therefore this FSA has no requirements set including any for accreditation. The Regulator intends to issue guidance documents for this FSA to support accreditation to ISO 17020 and intends to incorporate these guidance documents into the next version of this Code as an appendix. This intended addition will be subject to consultation as set out in s3 of the Act.
Examination of Fire Scenes (Section 85)	This FSA is not subject to this version of this Code therefore this FSA has no requirements set including any for accreditation. The Regulator intends to issue guidance documents for this FSA to support accreditation to ISO 17020 and intends to incorporate these guidance documents into the next version of this Code as an appendix. This intended addition will be subject to consultation as set out in s3 of the Act.
Examination to Establish the Origin and Cause of an Explosion (Section 86)	This FSA is not subject to this version of this Code therefore this FSA has no requirements set including any for accreditation.
Forensic examination of Sexual Offence Complainants (Section 47)	Compliance with the Code from the effective date of the Code. Accreditation to ISO 15189 by 24 months of the effective date of the Code (for the sub-activities the organisation undertakes which are required to be on the accreditation scope).

Forensic Science Activity	Summary of Requirements
	Within 24 months of the effective date of the Code the organisation must demonstrate compliance with the Code by having a schedule of accreditation that includes the Code and reflects all FSAs (or parts thereof) that the organisation undertakes.
Forensic Examination of Detainees (Section 87)	This FSA is not subject to this version of this Code therefore this FSA has no requirements set including any for accreditation.
Forensic Examination of Deceased Individuals (Section 87)	This FSA is not subject to this version of this Code therefore this FSA has no requirements set including any for accreditation.
Human Biological Material Examination (Section 48)	Compliance with the Code from the effective date of the Code. Accreditation to ISO 17025 from the effective date of the Code (for the sub-activities the organisation undertakes which are required to be on the accreditation scope). Within 24 months of the effective date of the Code the organisation must demonstrate compliance with the Code by having a schedule of accreditation that includes the Code and reflects all FSAs (or parts thereof) that the organisation undertakes.
Human Body Fluid Distribution Analysis (Section 49)	Compliance with the Code from the effective date of the Code. Accreditation to ISO 17025 from the effective date of the Code (for the sub-activities the organisation undertakes which are required to be on the accreditation scope). Within 24 months of the effective date of the Code the organisation must demonstrate compliance with the Code by having a schedule of accreditation that includes the Code and reflects all FSAs (or parts thereof) that the organisation undertakes.
Human DNA Analysis (Section 50)	Compliance with the Code from the effective date of the Code. Accreditation to ISO 17025 from the effective date of the Code (for the sub-activities the organisation undertakes which are required to be on the accreditation scope).

Forensic Science Activity	Summary of Requirements
	Within 24 months of the effective date of the Code the organisation must demonstrate compliance with the Code by having a schedule of accreditation that includes the Code and reflects all FSAs (or parts thereof) that the organisation undertakes.
Human Kinship Analysis (Section 50)	Compliance with the Code from the effective date of the Code. Accreditation to ISO 17025 from the effective date of the Code (for the sub-activities the organisation undertakes which are required to be on the accreditation scope). Within 24 months of the effective date of the Code the organisation must demonstrate compliance with the Code by having a schedule of accreditation that includes the Code and reflects all FSAs (or parts thereof) that the organisation undertakes.
Non-Human Biological Examination: Vertebrates (Section 52)	Compliance with the Code from the effective date of the Code. Accreditation to ISO 17025 from the effective date of the Code (for the sub-activities the organisation undertakes which are required to be on the accreditation scope). Within 24 months of the effective date of the Code the organisation must demonstrate compliance with the Code by having a schedule of accreditation that includes the Code and reflects all FSAs (or parts thereof) that the organisation undertakes.
Non-Human Biological Examination – Plants, Microbes, and Invertebrates (Section 89)	This FSA is not subject to this version of this Code therefore this FSA has no requirements set including any for accreditation.
Toxicology: Analysis for Drug(s), Alcohol, and/or Noxious Substances (Section 53)	Compliance with the Code from the effective date of the Code. Accreditation ISO 17025 or ISO 15189 from the effective date of the Code (for the sub-activities the organisation undertakes which are required to be on the accreditation scope). Within 24 months of the effective date of the Code the organisation must demonstrate compliance with the Code by having a schedule of

Forensic Science Activity	Summary of Requirements
	accreditation that includes the Code and reflects all FSAs (or parts thereof) that the organisation undertakes.
Toxicology: Analysis for Drugs and Alcohol under the Road Traffic Act 1988, Transport and Works Act 1992, and Railways and Transport Safety Act 2003 (Section 54)	Compliance with the Code from the effective date of the Code. Accreditation to ISO 17025 or ISO 15189 from the effective date of the Code (for the sub-activities the organisation undertakes which are required to be on the accreditation scope). Within 24 months of the effective date of the Code the organisation must demonstrate compliance with the Code by having a schedule of accreditation that includes the Code and reflects all FSAs (or parts thereof) that the organisation undertakes.
Toxicology: Analysis for Drugs in Relation to s5A of the Road Traffic Act 1988 (Section 55)	Compliance with the Code from the effective date of the Code. Accreditation to ISO 17025 or ISO 15189 from the effective date of the Code (for the sub-activities the organisation undertakes which are required to be on the accreditation scope). Within 24 months of the effective date of the Code the organisation must demonstrate compliance with the Code by having a schedule of accreditation that includes the Code and reflects all FSAs (or parts thereof) that the organisation undertakes.
Toxicology: Alcohol Technical Calculations (Section 90)	This FSA is not subject to this version of this Code therefore this FSA has no requirements set including any for accreditation.
Analysis to Identify and Quantify Drugs and/or Associated Materials (Section 56)	Compliance with the Code from the effective date of the Code. Accreditation to ISO 17025 from the effective date of the Code (for the sub-activities the organisation undertakes which are required to be on the accreditation scope). Within 24 months of the effective date of the Code the organisation must demonstrate compliance with the Code by having a schedule of accreditation that includes the Code and reflects all FSAs (or parts thereof) that the organisation undertakes.

Forensic Science Activity	Summary of Requirements
Examination and Analysis relating to the Preparation and Production of Drugs and/or Psychoactive Substances (Section 91)	This FSA is not subject to this version of this Code therefore this FSA has no requirements set including any for accreditation.
Friction Ridge Detail: Visualisation and Enhancement (Section 57)	Compliance with the Code from the effective date of the Code. Accreditation to ISO 17025 from the effective date of the Code (for the sub-activities the organisation undertakes which are required to be on the accreditation scope). Within 24 months of the effective date of the Code the organisation must demonstrate compliance with the Code by having a schedule of accreditation that includes the Code and reflects all FSAs (or parts thereof) that the organisation undertakes.
Friction Ridge Detail: Comparison (Section 58)	Compliance with the Code from the effective date of the Code. Accreditation to ISO 17025 from the effective date of the Code (for the sub-activities the organisation undertakes which are required to be on the accreditation scope). Within 24 months of the effective date of the Code the organisation must demonstrate compliance with the Code by having a schedule of accreditation that includes the Code and reflects all FSAs (or parts thereof) that the organisation undertakes.
Footwear: Coding and Scene Linking (Section 59)	Compliance with the Code from the effective date of the Code. Accreditation to ISO 17025 from the effective date of the Code (for the sub-activities the organisation undertakes which are required to be on the accreditation scope). Within 24 months of the effective date of the Code the organisation must demonstrate compliance with the Code by having a schedule of accreditation that includes the Code and reflects all FSAs (or parts thereof) that the organisation undertakes.

Forensic Science Activity	Summary of Requirements
Footwear Screening (Section 60)	Compliance with the Code from the effective date of the Code. Accreditation to ISO 17025 from the effective date of the Code (for the sub-activities the organisation undertakes which are required to be on the accreditation scope). Within 24 months of the effective date of the Code the organisation must demonstrate compliance with the Code by having a schedule of accreditation that includes the Code and reflects all FSAs (or parts thereof) that the organisation undertakes.
Footwear Mark Comparisons (Section 61)	Compliance with the Code from the effective date of the Code. Accreditation to ISO 17025 from the effective date of the Code (for the sub-activities the organisation undertakes which are required to be on the accreditation scope). Within 24 months of the effective date of the Code the organisation must demonstrate compliance with the Code by having a schedule of accreditation that includes the Code and reflects all FSAs (or parts thereof) that the organisation undertakes.
Marks Visualisation and Enhancement (Section 62)	Compliance with the Code from the effective date of the Code. Accreditation to ISO 17025 from the effective date of the Code (for the sub-activities the organisation undertakes which are required to be on the accreditation scope). Within 24 months of the effective date of the Code the organisation must demonstrate compliance with the Code by having a schedule of accreditation that includes the Code and reflects all FSAs (or parts thereof) that the organisation undertakes.
Marks Comparison (Section 63)	Compliance with the Code from the effective date of the Code. Accreditation to ISO 17025 from the effective date of the Code (for the sub-activities the organisation undertakes which are required to be on the accreditation scope).

Forensic Science Activity	Summary of Requirements
	Within 24 months of the effective date of the Code the organisation must demonstrate compliance with the Code by having a schedule of accreditation that includes the Code and reflects all FSAs (or parts thereof) that the organisation undertakes.
Damage and Physical Fit (Section 64)	Compliance with the Code from the effective date of the Code. Accreditation to ISO 17025 from the effective date of the Code (for the sub-activities the organisation undertakes which are required to be on the accreditation scope). Within 24 months of the effective date of the Code the organisation must demonstrate compliance with the Code by having a schedule of accreditation that includes the Code and reflects all FSAs (or parts thereof) that the organisation undertakes.
Taggant Analysis (Section 65)	Compliance with the Code from the effective date of the Code. Accreditation to ISO 17025 from the effective date of the Code (for the sub-activities the organisation undertakes which are required to be on the accreditation scope). Within 24 months of the effective date of the Code the organisation must demonstrate compliance with the Code by having a schedule of accreditation that includes the Code and reflects all FSAs (or parts thereof) that the organisation undertakes.
Analysis of Corrosives and/or Noxious substances (Section 66)	Compliance with the Code from the effective date of the Code. Accreditation to ISO 17025 from the effective date of the Code (for the sub-activities the organisation undertakes which are required to be on the accreditation scope). Within 24 months of the effective date of the Code the organisation must demonstrate compliance with the Code by having a schedule of accreditation that includes the Code and reflects all FSAs (or parts thereof) that the organisation undertakes.

Forensic Science Activity	Summary of Requirements
Analysis of Residues of Lubricants used in Sexual Offences, Including Oils, Greases, and Lubricants (Section 67)	Compliance with the Code from the effective date of the Code. Accreditation to ISO 17025 from the effective date of the Code (for the sub-activities the organisation undertakes which are required to be on the accreditation scope). Within 24 months of the effective date of the Code the organisation must demonstrate compliance with the Code by having a schedule of accreditation that includes the Code and reflects all FSAs (or parts thereof) that the organisation undertakes.
Analysis of Ignitable Liquids and their Residues (Section 68)	Compliance with the Code from the effective date of the Code. Accreditation to ISO 17025 from the effective date of the Code (for the sub-activities the organisation undertakes which are required to be on the accreditation scope). Within 24 months of the effective date of the Code the organisation must demonstrate compliance with the Code by having a schedule of accreditation that includes the Code and reflects all FSAs (or parts thereof) that the organisation undertakes.
Examination and Analysis of Particulate Trace Materials (Section 69)	Compliance with the Code from the effective date of the Code. Accreditation to ISO 17025 from the effective date of the Code (for the sub-activities the organisation undertakes which are required to be on the accreditation scope). Within 24 months of the effective date of the Code the organisation must demonstrate compliance with the Code by having a schedule of accreditation that includes the Code and reflects all FSAs (or parts thereof) that the organisation undertakes.
Examination and Analysis of Gunshot Residue (Section 70)	Compliance with the Code from the effective date of the Code. Accreditation to ISO 17025 from the effective date of the Code (for the sub-activities the organisation undertakes which are required to be on the accreditation scope).

Forensic Science Activity	Summary of Requirements
	Within 24 months of the effective date of the Code the organisation must demonstrate compliance with the Code by having a schedule of accreditation that includes the Code and reflects all FSAs (or parts thereof) that the organisation undertakes.
Examination, and Classification of Firearms, Ammunition, and Associated Materials (Section 71)	Compliance with the Code from the effective date of the Code. Accreditation to ISO 17025 from the effective date of the Code (for the sub-activities the organisation undertakes which are required to be on the accreditation scope). Within 24 months of the effective date of the Code the organisation must demonstrate compliance with the Code by having a schedule of accreditation that includes the Code and reflects all FSAs (or parts thereof) that the organisation undertakes.
Firearms: Ballistics (Section 72)	Compliance with the Code from the effective date of the Code. Accreditation to ISO 17025 from the effective date of the Code (for the sub-activities the organisation undertakes which are required to be on the accreditation scope). Within 24 months of the effective date of the Code the organisation must demonstrate compliance with the Code by having a schedule of accreditation that includes the Code and reflects all FSAs (or parts thereof) that the organisation undertakes.
Examination and Analysis of Vehicle Components (Section 73)	Compliance with the Code from the effective date of the Code. Accreditation to ISO 17025 from the effective date of the Code (for the sub-activities the organisation undertakes which are required to be on the accreditation scope). Within 24 months of the effective date of the Code the organisation must demonstrate compliance with the Code by having a schedule of accreditation that includes the Code and reflects all FSAs (or parts thereof) that the organisation undertakes.

Forensic Science Activity	Summary of Requirements
Examination and Analysis of Hazardous Chemical and Biological Agents and Associated Materials (Section 74)	Compliance with the Code from the effective date of the Code. Accreditation to ISO 17025 from the effective date of the Code (for the sub-activities the organisation undertakes which are required to be on the accreditation scope). Within 24 months of the effective date of the Code the organisation must demonstrate compliance with the Code by having a schedule of accreditation that includes the Code and reflects all FSAs (or parts thereof) that the organisation undertakes.
Examination and Analysis of Radioactive Material (Section 92)	This FSA is not subject to this version of this Code therefore this FSA has no requirements set including any for accreditation.
Examination and Analysis of Explosives, Explosives Precursors, and Explosive Residues (Section 75)	Compliance with the Code from the effective date of the Code. Accreditation to ISO 17025 from the effective date of the Code (for the sub-activities the organisation undertakes which are required to be on the accreditation scope). Within 24 months of the effective date of the Code the organisation must demonstrate compliance with the Code by having a schedule of accreditation that includes the Code and reflects all FSAs (or parts thereof) that the organisation undertakes.
Examination and Analysis of Suspected Explosive Devices and Associated Material (Section 93)	This FSA is not subject to this version of this Code therefore this FSA has no requirements set including any for accreditation.
Data Capture and Processing from Digital Storage Devices (Section 76)	Compliance with the Code from the effective date of the Code. Accreditation to ISO 17025 from the effective date of the Code (for the sub-activities the organisation undertakes which are required to be on the accreditation scope). Within 24 months of the effective date of the Code the organisation must demonstrate compliance with the Code by having a schedule of accreditation that includes the Code and reflects all FSAs (or parts thereof) that the organisation undertakes.

Forensic Science Activity	Summary of Requirements
Digital Data Analysis (Section 77)	Compliance with the Code from the effective date of the Code. Accreditation to ISO 17025 from the effective date of the Code (for the sub-activities the organisation undertakes which are required to be on the accreditation scope). Within 24 months of the effective date of the Code the organisation must demonstrate compliance with the Code by having a schedule of accreditation that includes the Code and reflects all FSAs (or parts thereof) that the organisation undertakes.
Network Capture and Analysis (Section 94)	This FSA is not subject to this version of this Code therefore this FSA has no requirements set including any for accreditation.
Geolocation analysis (Section 78)	Compliance with the Code from the effective date of the Code. Accreditation to ISO 17025 by 24 months of the effective date of the Code (for the sub-activities the organisation undertakes which are required to be on the accreditation scope). Within 24 months of the effective date of the Code the organisation must demonstrate compliance with the Code by having a schedule of accreditation that includes the Code and reflects all FSAs (or parts thereof) that the organisation undertakes.
Recovery and Processing of footage from CCTV/VSS (Section 79)	Compliance with the Code and accreditation to ISO 17025 is only required if the activity is preparatory work for the FSA 'Specialist Video Multimedia, Recovery, Processing and Analysis', or the organisation is not acting in accordance with the NPCC Framework for Video Based Evidence.
Specialist Video Multimedia, Recovery, Processing and Analysis (Section 80)	Compliance with the Code from the effective date of the Code. Accreditation to ISO 17025 from the effective date of the Code (for the sub-activities the organisation undertakes which are required to be on the accreditation scope). Within 24 months of the effective date of the Code the organisation must demonstrate compliance with the Code by having a schedule of

Forensic Science Activity	Summary of Requirements
	accreditation that includes the Code and reflects all FSAs (or parts thereof) that the organisation undertakes.
Technical Audio Operations (Section 81)	Compliance with the Code from the effective date of the Code. Accreditation to ISO 17025 from the effective date of the Code (for the sub-activities the organisation undertakes which are required to be on the accreditation scope). Within 24 months of the effective date of the Code the organisation must demonstrate compliance with the Code by having a schedule of accreditation that includes the Code and reflects all FSAs (or parts thereof) that the organisation undertakes.
Speech and Audio Analysis (Section 95)	This FSA is not subject to this version of this Code therefore this FSA has no requirements set including any for accreditation.
Document Handwriting (Section 82)	Compliance with the Code from the effective date of the Code. Accreditation to ISO 17025 from the effective date of the Code (for the sub-activities the organisation undertakes which are required to be on the accreditation scope). Within 24 months of the effective date of the Code the organisation must demonstrate compliance with the Code by having a schedule of accreditation that includes the Code and reflects all FSAs (or parts thereof) that the organisation undertakes.
Document Authenticity and Origin (Section 83)	Compliance with the Code from the effective date of the Code. Accreditation to ISO 17025 from the effective date of the Code (for the sub-activities the organisation undertakes which are required to be on the accreditation scope). Within 24 months of the effective date of the Code the organisation must demonstrate compliance with the Code by having a schedule of accreditation that includes the Code and reflects all FSAs (or parts thereof) that the organisation undertakes.

Forensic Science Activity	Summary of Requirements
Case Review (Section 96)	This FSA is not subject to this version of this Code therefore this FSA has no requirements set including any for accreditation.
Control and Management of a Forensic Database Service (Section 97)	This FSA is not subject to this version of this Code therefore this FSA has no requirements set including any for accreditation.

Part C - The Code

10. Legal Basis

10.1.1 This document is the code of practice issued by the Forensic Science Regulator pursuant to the provisions of s2 of the 2021 Act [10].

10.1.2 Compliance with the provisions of the 2021 Act [10] is set out on page 3.

10.1.3 In accordance with s3(4) of the 2021 Act [10] the provisions of this Code come into force at 00:00:01 on [Date to be inserted].

11. General

11.1 Scope

11.1.1 This Code applies to any forensic unit[14] undertaking an FSA to which this Code applies. The FSAs which are subject to this Code are set out in the FSA definitions (see F3 - FSAs – Definitions subject to this Code).

11.1.2 This Code specifies the requirements for competence for undertaking FSAs. Where relevant, appropriate legal, regulatory and information security provisions are included.

11.2 Normative References

11.2.1 The following normative references are cited in this Code and, in areas where accreditation to an international standard is required by this Code, form the basis of demonstration of compliance with the requirements of this Code. References:

a. BS EN ISO/IEC 17025:2017, General requirements for the competence of testing and calibration laboratories; [1]

b. ILAC-G19:06/2022, Modules in a Forensic Science Process; [3]

[14] See glossary entry ‘Forensic Unit’.

c. BS EN ISO/IEC 17020:2012, General criteria for the operation of various types of bodies performing inspection; [2]

d. UKAS-RG 201:2015, Accreditation of Bodies Carrying Out Scene of Crime Examination (Edition 2); [17]

e. BS EN ISO 15189:2012, Medical laboratories. Requirements for quality and competence; [18] and

f. BS EN ISO/IEC 17000:2020, Conformity assessment. Vocabulary and general principles. [19]

11.3 Terms and Definitions

11.3.1 For the purposes of this Code, the definitions of terms are provided in section 109 – Glossary.

11.3.2 The meanings of abbreviations and acronyms are given in section 108 - Acronyms and Abbreviations.

11.3.3 The word ‘shall’ is used in this Code where the clause is a requirement.

11.3.4 The word ‘should’ is used in this Code to indicate the clause is a recommendation based on generally accepted practice in the forensic science profession.

11.4 Application of Standards

The Code

11.4.1 This Code sets out the standards, and other requirements, which apply to each FSA. The standards/requirements may be different for each FSA. [15]

11.4.2 Every FSA which is subject to this Code shall comply with the standards of conduct and standards of practice contained in the main Code.

[15] See s2(2)(c) of the 2021 Act [10].

11.4.3 Where an FSA is subject to this Code the Regulator may also require compliance with the standards of practice contained in one, or more, of the appendices to this Code (see Part F – Appendices).

11.4.4 For each FSA which is subject to this Code the requirements in this Code operate from the date this Code becomes effective (the date specified in section 10). All forensic units must comply with the provisions of the Code from the effective date set out in section 10.

11.4.5 This Code may include provisions with regard to demonstration of compliance (either generally or for specific FSAs) which are not operative from the date this Code takes effect (i.e. the date may be set in the future). In these areas the requirements of this Code must be complied with from the Code effective date but the demonstration of compliance (e.g. by accreditation) is not required until the date specified. Forensic units should aim to achieve the requirement before the date specified.

Non-Code Standards Documents

11.4.6 The Regulator may work with other bodies (e.g. professional bodies or regulators) to support the production of standards or requirements for certain fields of forensic science.

11.4.7 Unless such documents are incorporated into this Code, they do not form part of the code issued under the provisions of s2 2021 Act [10].

Other Documents

11.4.8 The Regulator may issue other documents (e.g. guidance documents). These do not form part of the Code issued under s2 2021 Act [10].

11.5 Dealing with Changes to References

11.5.1 In this Code any reference to legislation (e.g. statute or secondary legislation) shall be taken to mean the following.

a. The legislation as amended.

b. Any secondary legislation created under powers contained within the statute.

c. Where the legislation is repealed and replaced, the new provisions.

11.5.2 In this Code any reference to a Home Office Circular shall be taken to mean the following.

a. The Circular as amended.

b. If the Circular is withdrawn any Circular which replaces it.

11.5.3 In this Code any reference to a specific body (e.g. a Government department) shall be taken to mean the following.

a. The body regardless of if the name is altered.

b. If the body is abolished, any successor body.

c. If responsibilities are transferred to another body, to that body.

12. Modification

12.1 General

12.1.1 This is a consultation draft of the code. This is Consultation Draft 08.08.2022.

12.2 Tracking

12.2.1 Subsequent issues of the code will adopt the following approach.

a. Significant changes from the previous issue will be highlighted in grey, significant deletions will be marked as “[deleted text]”.

b. Where sections are inserted, moved or renumbered, the subsequent renumbering of sections that follow will not generally be marked.

c. To comply with the Regulations on accessibility [20] the changes will be listed in a footnote to this section.

12.3 Approach

12.3.1 The Regulator will, under normal circumstances, modify this Code in the following manner.

a. The Regulator shall publish a notice of intent to modify this Code setting out the proposed changes. The proposed timescales for the changes will be set out.

b. The notice of intention to modify this Code will provide at least six months’ notice of the proposed changes.

c. The Regulator shall undertake a consultation, as required by the 2021 Act [10], on the proposed changes before finalising the changes which will be made to this Code.

d. The Regulator shall publish the Code which is to be submitted for approval under the provisions of s3 2021 Act [10].

e. Where common commencement dates have been introduced by HM Government for implementation of regulation, consideration shall be given to the use of those dates.

12.3.2 While the above text sets out the normal approach it must be recognised that the role of the Regulator is, in part, to protect the CJS. Circumstances may arise where this process will not be followed.

12.4 Review

12.4.1 This document is subject to review at regular intervals. Comments should be sent to the address, or email provided, at: www.gov.uk/government/organisations/forensic-science-regulator.

13. Supremacy Provision

13.1 General

13.1.1 It may be necessary to publish a modified version of the code (e.g. a version in a different language or one addressing specific accessibility issues). If such a version is published, its nature as a secondary version of this Code will be made clear in the document. This may lead to the existence of a prime version and one or more secondary versions of the code.

13.1.2 In any case where there is a discrepancy between the wording of the prime and a secondary version, the prime version shall prevail.

13.2 Online Publication

13.2.1 The code may be published online as both PDF and HTML versions.

13.2.2 In all cases the PDF version is to be taken as the definitive version of this Code.

Part D - Standards of Conduct

14. Standards of Conduct

14.1.1 The Regulator sets out, for all persons carrying on any FSA to which this Code applies (and this Code specifies compliance in the FSA definition), the values and ideals the profession stands for. These Standards of Conduct provide a clear statement to commissioning parties, the CJS, and the public of what they have a right to expect.

14.1.2 As a person undertaking an FSA you shall.

1. Recognise your overriding duty is to the court and to the administration of justice. [21]
2. Act with honesty, integrity, objectivity, and impartiality.
3. Comply with the legal obligations imposed on practitioners (and specifically expert witnesses) in the jurisdiction(s) in which you practice. [21]
4. Declare, at the earliest opportunity, any personal, business, financial, and/or other interest, or situation, that could be perceived as a potential conflict of interest.
5. Act, and in particular provide expert advice and evidence, only within the limits of your professional competence.
6. Maintain and develop your professional competence, taking account of material research and developments within the relevant field.
7. Inform those commissioning you, in writing, of any information which may reasonably be considered to undermine your credibility as a practitioner or the reliability of the material you produce and include this information with/within any written report provided to those commissioning you.
8. Establish the integrity and continuity of items/exhibits as they come into your possession and ensure these are maintained whilst the items/exhibits remain in your possession.

9. Seek access to items/exhibits/information that may have a significant impact on the output from your work [16] and record both the request for the items/exhibits/information and the result of that request.

10. Conduct casework using methods of demonstrated validity.

11. Be prepared to review any casework if any new information or developments are identified that would significantly impact on the output from your work. [17]

12. Where you have grounds for believing a situation may result in a miscarriage of justice, ensure that the relevant commissioning party is informed either by (a) invoking the appropriate organisational processes for addressing potential miscarriages of justice or (where you do not operate as part of an organisation or the organisation does not have appropriate procedures) (b) by informing the party directly.

13. Preserve confidentiality unless the law obliges, a court/tribunal orders, or a commissioning party explicitly authorises disclosure.

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16 Particularly conclusions reported in any report or in evidence.

17 Particularly conclusions reported in any report or in evidence.

Part E - Standards of Practice

15. Application

15.1.1 The Standards of Practice, subject to the point in section 15.1.2, apply to all forensic units undertaking an FSA to which this Code applies where compliance is specified in the FSA definition (see F3 - FSAs – Definitions subject to this Code).

15.1.2 It is recognised that the CJS may require the assistance of an expert who does not normally operate in the area of forensic science. Where such an expert is commissioned in relation to an FSA to which this Code applies, the expert shall not be subject to the provisions of the Standards of Practice set out in the main Code but shall comply with the provisions of section 40.2 (which discusses the relevant provisions with regard to Infrequently Commissioned Experts).

16. Management Requirements

16.1 General

16.1.1 Where this Code specifies accreditation for an FSA, the forensic unit shall have a Schedule of Accreditation covering compliance with the standards identified in this Code for the aspects of the FSA it undertakes. Provisions in this Code vary this requirement with regard to Infrequently Commissioned Experts (see section 40) and/or where the provisions for infrequently used methods apply (see section 28.3.50 et seq).

16.1.2 The forensic unit shall define all roles that could influence the performance of the FSA undertaken and detail the competencies (see section 26.3) required for these roles.

16.1.3 These roles include all those performing the following as part of an FSA or identified as influencing the undertaking of the FSA.

a. Review of Requests, Tenders and/or Contracts (see section 21).

b. Support services e.g. cleaning of examination areas.

c. Planning and performing FSAs.

d. Operating analytical instruments/equipment.

e. Performing critical findings checks and peer review.

f. Signing/issuing reports.

g. Providing interpretations/opinion.

h. Software installation, authorisation for software changes and administration of firmware and software (e.g. analytical software, anti-malware software).

i. Development, validation, and verification of new, adopted, or adapted methods.

16.1.4 Where a role is supporting the delivery of the FSA but not directly undertaking the FSA (e.g. cleaning personnel with access to examination areas), role specific awareness training (e.g. security, confidentiality, integrity, contamination control) should be given and documented.

16.1.5 Where top management is referred to in relevant normative references (see section 11.2), this should usually be at Chief Officer or board level and, in this Code, is referred to as the Senior Accountable Individual (see 16.2).

16.2 Senior Accountable Individual

Appointment

16.2.1 Where a forensic unit is comprised of two, or more, practitioners it shall appoint a senior manager (that being at director, partner, board level, chief officer level, or equivalent) to be the Senior Accountable Individual (SAI).

16.2.2 Where a forensic unit is comprised of only one practitioner that practitioner shall be the SAI.

Role

16.2.3 The SAI shall be accountable for the strategic leadership of the forensic unit's compliance with this Code and be accountable for risks related to any FSA undertaken by, or under the control of, the forensic unit. There should be particular focus on any risks which could adversely affect an investigation or impede or prejudice the course of justice in any proceedings.

16.2.4 The 2021 Act [10] makes provision for circumstances where the Regulator has reason to believe or believes that a person may be undertaking a forensic science activity to which this Code applies in a way that creates a substantial risk of: [18]

a. Adversely affecting any investigation, or

b. Impeding or prejudicing the course of justice in any proceedings.

16.2.5 The SAI shall be accountable, on behalf of the forensic unit, in relation to any investigation or compliance action by the Regulator. [19]

16.2.6 The SAI shall have the authority to make decisions and deploy resources to address quality matters in the forensic unit.

16.2.7 The name, and contact details, of the SAI shall be notified to the Regulator. The SAI will be the route through which any communications related to action under sections 5 and/or 6 of the 2021 Act [10] will be addressed. [20]

16.2.8 The forensic unit shall promptly (and in any event within 30 days) notify the Regulator, of any change in the information provided about the SAI.

Requirements

16.2.9 The forensic unit shall have a document setting out the following for each SAI.

a. The name of the SAI.

b. The date of appointment of the SAI.

c. The responsibilities of the SAI.

16.2.10 The SAI shall endorse the document which sets out their role and responsibilities from the date of taking on these responsibilities.

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18 The term ‘substantial risk’ in the 2021 Act [10] has not yet been considered by the courts. The term is used in the Contempt of Court Act 1981 [140] and the meaning has been considered by the courts in that context. See, for example, Her Majesty’s Attorney General v. Express Newspapers [2004] EWHC 2859 (Admin).

19 The responsibilities of the forensic unit in relation to investigations and compliance action by the Regulator are discussed in section 23.3 of this Code.

20 The role of the Senior Accountable Individual does not require that all communications between a forensic unit and the Regulator go through that individual.

17. Business Continuity

17.1.1 The forensic unit shall have procedures to be implemented following interruption to, or failure of, business critical processes, to maintain or restore operations and ensure availability of information (at a level which prevents significant interruption to operations), and both confidentiality and integrity of that information. [21] [22]

17.1.2 The business continuity procedures shall include:

a. An IT incident management plan for retrieval of critical data (see section 30, Control of Data); and

b. Consideration of what additional supporting information would be required to support case file data (e.g. validation reports, calibration records).

17.1.3 A forensic unit may need to use externally provided services in the undertaking of all (or any part of) an FSA (see section 22). The commissioning forensic unit should ensure that its business continuity procedures include provision to preserve and/or recover any material transferred to (or generated in) the facility commissioned to perform the work. Where externally provided services are performed by a separate legal entity, these business continuity procedures should include the safeguards should that legal entity go out of business with no legal successor (e.g. through stipulation in a contract with the legal entity in question to assist in receivership disputes).

17.1.4 The business continuity procedures shall be tested, for each area of work and/or site, in proportion to risk (at least once in an accreditation cycle) and the results documented. [23] Any identified need for action to modify the plans shall be implemented and the plans re-tested.

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21 Further guidance, if required, can be obtained from ISO 22313:2020 Security and resilience — Business continuity management systems — Guidance on the use of ISO 22301. [151] [153]

22 Commissioning parties should ensure that its own business continuity plans have addressed the risk that a provider goes out of business with no legal successor, to ensure retained material, case files and associated paperwork is available (e.g. continuity and access records, validation records, competency records, calibration and maintenance records). Ideally this should be through stipulation in a contract, clarifying that copies of certain information need to be supplied with the case files.

23 This should be scaled based upon risk, in some circumstances a desk-top exercise may be justifiable.

18. Independence, Impartiality and Integrity

18.1.1 The forensic unit shall ensure that all of its practitioners are made aware of, and adhere to, the Standards of Conduct in respect of their independence, impartiality and integrity, and that the organisational structure, policies and procedures support this rather than hinder it.

18.1.2 Conflicts of interest, perceived or otherwise, and threats to impartiality may include a practitioner:

a. Having, or being perceived to have, an interest in the outcome of the case;

b. Being coerced or having the perception of being coerced, openly or secretively; [24]

c. Being asked to disregard critical findings that support/undermine either the prosecution's or the defence's position;

d. Being asked (except where there is a clear legal reason for doing so) to limit the information being provided to the court including, but not limited to, findings that contradict any issued report(s);

e. Being the sole reviewer of their critical findings;

f. Being involved with activities that could be perceived as witness coaching or being coached, rather than training or familiarisation;

g. Being over-familiar with, or trusting, another person instead of relying on objective evidence;

h. Having organisational and management structures that could be perceived to reward, encourage or support bias;

i. Having a close/significant personal or financial relationship with a party likely to be affected by the outcome of:

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[24] The question of perception may be judged by reference to the test for apparent bias of members of the judiciary. In Magill v. Porter [2001] UKHL 67 the court noted "[The Court] must then ask whether those circumstances would lead a fair-minded and informed observer to conclude that there was a real possibility that the tribunal was biased".

i. The practitioner's work; and/or

ii. The case;

j. Having a close/significant personal or financial relationship with any person acting as an expert witness in the case; or

k. Acting in self-interest.

18.1.3 It is possible for a conflict of interest to arise as a result of information held by a practitioner. This could be information, perhaps obtained from other parties to the case or previous dealings with some of the parties, making it difficult for the practitioner to adhere to their obligations to the CJS or their client.

18.1.4 A practitioner shall declare at once where they believe a conflict of interest may take place and there shall be a policy to address this eventuality.

18.1.5 Practitioners giving evaluative opinion should interpret the evidence in light of the propositions set out by all parties and provide evidence in a balanced manner.

18.1.6 The required policies and procedures (see 18.1.1) aim to control internal and external influence on the results of the FSA performed. The process map required to assure data integrity (see 30.1.2), should be used in the development of the procedure for the FSA to ensure the correct level of information is available to a practitioner relevant to the analysis at each stage of an FSA, and if identified as a risk that non-task relevant information is controlled, i.e. held back until the stage(s) which may be influenced by extraneous information is completed. [25]

18.1.7 The required policies and procedures should also cover the corrective action (such as formal disclosure) to be taken if there is a possibility of a practitioner's judgement having been, or perceived to have been, compromised (see also 38 - Retention, Recording, Revelation and Disclosure).

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[25] The process map should assess the risk of cognitive bias, the Regulator has published further guidance on this issue. [23]

19. Confidentiality

19.1.1 The forensic unit shall have documented policies and procedures detailing confidentiality (or equivalent) [26] requirements, including any disclosure requirements, and shall ensure that those requirements are applied to any externally provided services. The procedures shall address the following.

a. The material held by the forensic unit which is subject to an obligation of confidentiality.

b. The nature of the confidentiality obligation and its application to all personnel and external service providers.

c. The potential legal liability for breach of confidentiality.

d. The conditions that may allow the confidentiality to be waived or legally overridden and the process the forensic unit shall follow in such circumstances.

20. Document Control

20.1.1 The forensic unit shall apply document/version control procedures to the following where they are integral to the forensic process, including but not limited to:

a. Both hard copy and electronic copies;

b. Procedures – technical and quality;

c. Software;

d. Technical methods;

e. Forms;

f. Locally held copies of key external documents; and

g. Statutory documents (e.g. licences for possession of materials such as drugs or firearms).

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[26] These include any statutory restrictions on the use of information.

20.1.2 The retention period for obsolete/superseded documents should be defined and should take into account commissioning party [22], regulatory [27] and legal requirements. [28]

21. Review of Requests, Tenders and/or Contracts

General

21.1.1 This is the formal process of agreeing and recording the commissioning party's and forensic unit's interaction when requesting or tasking. Typically, where the commissioning party is external to the forensic unit, a commercial arrangement is entered into. [29] With internal parties this may be a request managed through some other work order control system. This Code does not seek to govern how commercial arrangements are entered into, only how work is controlled, and instructions are captured.

21.1.2 The processes surrounding the review of requests, tenders and/or contracts may occur at several different levels and at several key stages through the processing of forensic work. Any review taking place at whatever level shall be documented.

21.1.3 The issues to be addressed shall include how the following will apply before the work commences.

a. Whether the forensic unit can legally perform the work (e.g. does it have all required licences etc).

b. Whether the forensic unit has sufficient resource (amount and competence) to manage work and meet the requirements of the CJS.

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27 For example, the Code of Practice issued under the provisions of s23 Criminal Procedure and Investigations Act 1996 [129] and the requirements of this Code.

28 Some documents, such as standard operating procedures or validation reports, may be required for the life of the techniques and a blanket 30 years is often applicable from the last time the technique they refer to was used and/or reported.

29 Requirements set to the external forensic unit should also be applied to any externally provided services that forensic unit engages where they are delivering any part of the FSA.

c. Whether the forensic unit meets the standards required for the work and the necessary means of demonstrating compliance.

d. Whether the practitioners have the level of background checks (e.g. security checks) the commissioning party requires for the work (see section 26).

e. Whether the proposed work would properly address the issues for the CJS.

21.1.4 A documented policy is required, which shall include recording of all relevant instances when work requirements are discussed and reviewed such that a demonstrable audit trail, including appropriate justifications and authorisations, is available for each piece of work undertaken.

Developing an Examination Strategy

21.1.5 The purpose of an examination strategy is to ensure that the FSA, or suite of FSAs, being applied is appropriate to the investigative questions to be addressed. This may include, but not be limited to:

a. Identifying whether a crime has been committed;

b. Identifying or eliminating a suspect;

c. Validating the accounts of suspects, complainants, or witnesses; and/or

d. Establishing the sequence of events.

21.1.6 Prior to commencing work the forensic unit shall, in consultation with the commissioning party, identify the issue(s) in the case, develop an appropriate examination strategy, indicate the FSAs being proposed, sequence of sampling and/or examination, and agree the timescale for the delivery of the results. This may be in an overarching service level agreement (SLA)/contract for more routine casework.

21.1.7 In developing the examination strategy, as appropriate and as far as is practicable, the practitioner shall:

a. Ensure the relevant requirements of the commissioning party and associated examination strategy are understood;

b. Ensure that either all the necessary information (including on any previous examinations), and/or information about secondary scenes and/or items/exhibits required for an effective examination strategy are provided or that any resultant

limitations to the scope of the examination are discussed with the commissioning party and made clear to the CJS;

c. Establish all relevant details of the incident, including: [3]

i. The incident type and how this influences the scale of the examination; and

ii. What items/exhibits will or have been recovered for examination, the circumstances relating to the location and recovery of the items/exhibits.

d. Determine the facilities and techniques/equipment required;

e. Select and prioritise the examinations according to the needs of the criminal investigation, the commissioning solicitor, and/or the CJS, with consideration to the scenes and/or items/exhibits available.

i. Determine the sequence of examinations and/or of sampling of the items/exhibits with reference to potential cross contamination of scenes or items or loss of integrity of the items/exhibits prior to arrival at scene or coming into the practitioner's possession.

Evaluative Opinions

21.1.8 Where the forensic unit is commissioned to provide evaluative opinions the following provisions of this section apply.

21.1.9 The expert needs sufficient case-specific information to determine appropriate propositions, select appropriate analyses, and to interpret the observations from those analyses. Other than that information, the expert does not need, and should not see, any more case-specific information (such as information on previous convictions, reasons unrelated to the scientific analysis why investigators have identified a suspect, and any other extraneous information not relevant to the expert's task). [23]

21.1.10 The expert shall:

a. Consider the questions being asked by the commissioning party in the case and identify the issue(s) their analysis can address;

b. Consider all available, relevant case-specific information and, where necessary, request additional information; and

c. Discuss the issues to be addressed and potential propositions with the relevant commissioning party and where possible the other party. [30]

21.1.11 On the basis of the case circumstances and any agreed key issue(s), the following, where they have been put forward by the prosecution and defence (or their representatives), shall be identified.

a. The prosecution proposition(s).

b. The defence proposition(s).

21.1.12 There may be more than two propositions, but the assessment will, in general, consider the propositions in pairs; each pair shall be mutually exclusive.

22. Externally Provided Products and Services

22.1 Externally Provided Services

22.1.1 A forensic unit may obtain services from outside the forensic unit (externally provided services) [31] as part of the undertaking of all, or any part, of an FSA. This section applies to any externally provided service which could directly affect the quality of the forensic unit's undertaking of an FSA.

22.1.2 Forensic units shall have a procedure, and retain records for: [32]

a. Defining, reviewing and approving the forensic unit's requirements for using externally provided services;

b. Seeking/recording agreement from the commissioning party for the use of externally provided services in the FSA;

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30 It is recognised that this may not be routinely possible in volume crime case work.

31 Externally provided services can be obtained through any model (contractual or otherwise) including subcontracts.

32 Forensic units conducting activities which require accreditation to ISO 17025 [1] should note that although there is overlap with the standard's clause 6.6 Externally Provided Products and Services, the standard has wider requirements which also apply.

c. Specifying the requirements of the services to the external provider; and

d. Ensuring that external providers conform to relevant requirements of this Code. [33]

22.1.3 The forensic unit commissioning the work shall, as relevant to the FSA, ensure that:

a. All FSA related work meets the requirements set out in the FSA description;

b. All FSA related continuity, security and recording requirements are met; and

c. The provider of the external services has all required licences and/or approvals necessary to perform the work (see section 22.1.6).

22.1.4 The forensic unit obtaining the externally provided services remains responsible for the overall quality of the work, including that of any external element. [34]

22.1.5 Forensic units intending to obtain external services related to the undertaking of any FSA, or part of an FSA, which is subject to this Code shall include in its business continuity procedure the arrangements that have been made to preserve retained material [35] should their external provider or its contracted storage facility cease business and have no legal successor.

22.1.6 Where any externally provided work is subject to any requirement for approvals or licences established by law, rules, or convention, (such as work connected to firearms examination, child exploitation, drug analysis or for inclusion on the National DNA Database ® [36]), the external provider must be appropriately approved or licensed.

22.2 Externally Provided Products

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33 The records should include what aspects of compliance were deemed relevant, how assurance was achieved and may also include a record of any specific relevant key competencies any key staff providing the service were identified to hold to support the decision.

34 Clearly an externally provided service is likely to be subject to contractual obligations, if the externally provided service is a forensic science activity which is subject to this Code, the external provider will also be subject to this Code.

35 Including relevant data, reports, and records.

36 The National DNA Database is a registered trademark of the Secretary of State for the Home Department.

22.2.1 Forensic units shall ensure that any consumables, sampling/collection kits, packaging, and/or chemicals they use are fit for purpose. [37] Demonstration of fitness for purpose of externally provided materials is through initial validation and/or appropriate quality assurance of materials used in the method.

22.2.2 Forensic units should have in place a process for the ongoing review of the suitability of consumables and other externally provided products.

23. Quality Issues

23.1 Control of Non-Conforming FSA Related Work

23.1.1 The forensic unit shall have policies and procedures to identify non-conformances and, in addition, policies and procedures that are implemented when non-conforming work is identified.

23.1.2 Non-conformance refers to any aspect of the forensic unit's work in the undertaking of the FSA that does not conform to the forensic unit's policies, procedures, customer expectations, or this Code.

23.1.3 Examples of non-conformances, or things that indicate non-conformance may have occurred, include but are not limited to, significant instances of: [38]

a. Unexpected performance in proficiency testing/inter-laboratory comparison (see 35.1 - Inter-Laboratory Comparisons (Proficiency Tests and Collaborative Exercises));

b. A technical method being found to be producing erroneous results;

c. Missing or compromised items/exhibits and/or case files;

d. Equipment failing to receive timely calibration or maintenance;

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37 The manner in which this can be demonstrated may include consumable manufacturers and kit assemblers meeting the requirements set out in the Publicly Available Specification (PAS) 377:2012 Specification for consumables used in the collection, preservation and processing of material for forensic analysis - Requirements for product, manufacturing and forensic kit assembly [111] and/or BS ISO 18385:2016 Minimising the risk of human DNA contamination in products used to collect, store and analyse biological material for forensic purposes [110].

38 An issue is significant if it meets the test set out in section 23.1.6.

e. Staff failing to follow procedures or norms of integrity that impact on quality;

f. Any standards/reference materials, equipment or reagents being found to have defects or deficiencies;

g. Contamination incidents which may have an adverse impact on the CJS (e.g. those not identified through the use of quality controls within the method); [39]

h. Anything likely to cause a disruption to the provision of service at the expected quality, including but not limited to, removal/suspension of accreditation.

i. Unauthorised access to restricted areas or information;

j. Potential criminal activity by staff;

k. Withdrawal of security clearance from staff; or

l. Judicial criticism.

23.1.4 The forensic unit shall maintain a record of non-conformities which:

a. Is capable of being used to identify trends;

b. Includes any concessions obtained to use non-conforming work;

c. Includes any review reports (e.g. root cause analysis);

d. Details any corrective and/or preventive actions taken;

e. Details reviews of opportunities where similar non-conformances may occur and the preventative actions taken;

f. Record any evaluation of the corrective action; and

g. Is retained for at least as long as the case file retention period.

23.1.5 Initially the significance of a non-conformity in relation to the impact on the results shall be evaluated and its root cause identified. This review shall include assessment of any impact on casework already reported, remedial action

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[39] Whilst contamination incidents which are detected by the routine safeguards do not normally warrant notification to the Regulator, a significant number of such events may indicate an underlying issue worthy of reporting.

required on the individual non-conformity as well as whether the root cause analysis points to wider systemic issues which could indicate risk of reoccurrence or previously unidentified occurrence.

23.1.6 The forensic unit shall inform the Regulator about any non-conforming work if it has potential to significantly disaffect the commissioning party such that it could attract adverse public comment, be against the public interest, or lead to a miscarriage of justice, and the Regulator shall be provided with a report on the review of the non-conformity. [40]

23.2 Complaints

23.2.1 The forensic unit shall have policies and procedures for dealing with complaints. These procedures shall define what constitutes a complaint in relation to the work undertaken by the forensic unit and shall ensure that appropriately scaled reviews are instigated on receipt of any complaints.

23.2.2 The forensic unit shall inform the Regulator via fsrenquiries@homeoffice.gov.uk or to the address given at www.gov.uk/government/organisations/forensic-science-regulator at the earliest opportunity about any complaint or non-conforming FSA work if it has significantly disaffected any relevant party [41] such that it could attract adverse public comment, be against the public interest, or lead to a miscarriage of justice. The policies and procedures relating to complaints shall also indicate the escalation criteria and the individual/role holder responsible for notifying the Regulator.

23.2.3 Reviews prompted by complaints shall include examination of the potential impact on any work that has already been completed by the forensic unit. In the event that it is shown that there could have been an impact on any previous

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40 The Regulator shall be informed at the earliest opportunity once a reportable issue has been confirmed as a quality failure rather than after a potentially prolonged review. Basic information on the incident and likely timescale for the review is often all that is needed at the notification stage.

41 The term ‘relevant party’ means any person who is a party in the case (e.g. the prosecution and the defence), any person directly involved in the use of the output (e.g. law enforcement bodies, the Criminal Cases Review Commission), or the CJS.

work this should be dealt with through the non-conforming work process (see 23.1 - Control of Non-Conforming FSA Related Work).

23.2.4 The forensic unit shall retain records of all complaints and of the subsequent reviews and outcomes in line with the case file retention period. Where the complaint has been referred to the Regulator, a copy of the report on the finding of the review shall be provided to the Regulator.

23.2.5 Complaints may be received from many sources including the commissioning party, persons professing to be victims of crime, police forces, other departments within the same forensic unit, and the judicial system (including adverse court decisions pertinent to the work).

23.3 Regulator's Consideration of Quality Issues

General

23.3.1 The Regulator may become aware of quality issues in a forensic unit in several ways. These include, but are not limited to, the following.

a. Notification by a forensic unit under the provisions of section 23.1.6;

b. Notification by a forensic unit under the provisions of section 23.2.2;

c. Notification by a third party; and/or

d. Information in the public domain (e.g. a court judgment or media reports).

23.3.2 The Regulator's response to such quality issues depends on the nature of the issues and their potential impact. The options include, but are not limited to, the following.

a. To work with the forensic unit as part of the normal quality monitoring process to determine the nature of the issues and the appropriate response to reviews into non-conforming work.

b. To initiate an investigation under the provisions of s5 2021 Act [10].

c. To initiate compliance action under the provisions of s6 2021 Act [10].

23.3.3 The manner in which the Regulator deals with the appropriate response is set out in the published policy ### [24].

23.3.4 The following parts of section 23.3 sets out what the Regulator expects of forensic units when any quality issues are being considered by the Regulator.

Monitoring of Quality

23.3.5 Where the Regulator is considering a potential quality issue in a forensic unit, once the forensic unit is notified of this, the forensic unit shall:

a. Co-operate with the Regulator to the maximum extent possible;

b. Provide, as far as permitted by law, all information sought by the Regulator, or potentially relevant to the Regulator's consideration; and

c. Ensure sufficient resources are employed to address the issue in an agreed timescale.

Regulator's Investigations [s5 2021 Act [10]]

23.3.6 Where it is appropriate to initiate an investigation into any aspect of the work of a forensic unit, the forensic unit shall (when notified), in addition to the requirements set out above in relation to monitoring (see section 23.3.5):

a. Familiarise itself with the provisions of s5 2021 Act [10];

b. Ensure that all representatives involved in the Regulator's investigation are:

   i. Aware of the provisions of s5 2021 Act [10];

   ii. Aware of the potential consequences of non-compliance with notices issued under s5 2021 Act [10].

Compliance Action [s6-8 2021 Act [10]]

23.3.7 Where the Regulator initiates compliance processes in relation to any aspect of the work of a forensic unit, that unit shall (when notified), in addition to the requirements set out above in relation to monitoring (see section 23.3.5):

a. Familiarise itself with the provisions of sections 6-8 2021 Act [10];

b. Ensure all representatives involved in the Regulator's investigation are:

   i. Aware of the provisions of sections 6-8 2021 Act [10];

   ii. Aware of the consequences of non-compliance with any notice issued.

Reporting

23.3.8 The existence of a Regulator's investigation or compliance action (i.e. the issue of a compliance notice, the application for and/or granting of an injunction, the initiation of contempt proceedings or finding of contempt) may need to be disclosed in reports. Similarly, the fact that a Regulator's investigation or compliance action has previously taken place may need to be disclosed in reports. This is discussed in section 36.1.5.

24. Control of Records

24.1 General

24.1.1 The forensic unit shall establish retention times that satisfy the requirements of legislation[42], its accrediting body, the party commissioning the work [22] and this Code.

24.1.2 Records shall be stored and subsequently disposed of in a manner appropriate to their sensitivity and/or protective marking (e.g. incinerated or shredded to a specified standard which has been notified to the commissioning party).

24.1.3 Protective marking (e.g. with a Government Security Classification [25]) does not, by itself, provide an exemption to disclosure obligations. [26]

24.1.4 Where records are distributed across systems and/or locations, the forensic unit shall have a procedure to be able to retrieve and collate records required for reporting cases. The procedure shall detail the data types covered (see also procedural requirements in 30 - Control of Data).

[42] At the time of issue of this Code, the relevant requirements are set out in the Code of Practice issued under the provisions of s23 Criminal Procedure and Investigations Act 1996 [129].

24.2 Technical Records

24.2.1 As a minimum, the technical records [43] shall contain all relevant information relating to the following.

a. The collection and movement of material (physical items/exhibits, data and records), including:

i. The date (and time when critical) on which the material was taken or received;

ii. The date (and time when critical) of movement of the material to another party;

iii. From whom or where and to whom or where the material was moved; and

iv. The means by which the material was received or passed from/to another party (see 34 - Handling of Items/Exhibits).

b. Sufficient relevant detail to be able to trace any analytical output to:

i. A specific instrument;

ii. Instrument configuration, e.g. software version or, if relevant, firmware;

iii. The operator; and

iv. The date of the analysis.

c. The examination of items/exhibits, and materials recovered from items/exhibits.

d. Verbal and other communications, including reports.

e. Meetings attended and telephone conversations, including points of agreement or disagreement, and agreed actions.

f. Emails and other electronic transmissions (e.g. images) sent or received.

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[43] Technical records include accumulations of data and information that result from carrying out tests.

24.2.2 The records, in whatever form, shall be clear and comprehensive, and expressed in such a manner and in sufficient detail that another practitioner in the same field, and in the absence of the original practitioner, can follow the nature of the work undertaken, any interpretations/opinions made, and the inferences drawn from the work. This is particularly important in situations where re-examination (e.g. at scenes) is not possible, there is an insufficient quantity of the items/exhibit remaining for independent re-examination or testing, or the form of the items/exhibit is altered.

24.2.3 Technical records shall be produced contemporaneously with the examination. Where this is demonstrably not practicable, the reasons behind this and the risks shall be recorded, in the records when they are made. The practitioner shall begin making records from the time commission is received and shall continue making records throughout their involvement in the case. If there is any discussion about the case, or advice on tasking or submission was sought, prior or during contract review it may be appropriate to start making records before receiving formal instructions from the commissioning party.

24.2.4 Photography may be used as parts of contemporaneous notes. There shall be a procedure in place for its use, which shall draw distinction between record and evidential photography.

24.2.5 When a request for an examination is rejected, an item is rejected at submission, or a test result or report is rejected, the reasons for the original rejection shall be recorded, even if in the case of a report it is to be replaced.

24.2.6 For the period of record retention, traceability shall be maintained for all names, initials and/or identifiers. These should be legible and understandable.

24.2.7 It shall be possible to associate all changes to critical data with the person having made those changes. [44] [45] Reasons for the changes shall be recorded.

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[44] A system, for example, with timed and dated electronic signatures could achieve this aim.

[45] Changes to critical data shall be traceable, however it is accepted that some electronic systems may not always facilitate sufficient information to be included with the field in the same system. It is therefore acceptable for the records to be located in different systems or locations if this can be demonstrated to achieve the required traceability.

24.2.8 Hard copy records generated by the forensic unit used as part of the case file shall use a system which indicates completeness, for example through pagination using a page numbering system which indicates the total number of pages or an index sheet with this information. [46]

a. Each page of every document in the case record shall be traceable to the practitioner responsible for the sampling and/or performance of each examination or test, to a uniquely identified case and uniquely identified item/exhibit. [47]

b. It shall be clear from the case record who has performed all stages of the analysis or examination and when each stage of the analysis or examination was performed.

c. Alterations or comments in the records shall be clear and be signed, or otherwise be attributable to the individual who made them and dated.

24.3 Checking and Primary Review

General

24.3.1 The forensic unit shall have a procedure for checking and primary review. [48] For methods that require calculations [49] and/or critical data transfers (see 30.1.2) that are not part of a validated electronic process, the procedure shall include a requirement for effective checks of those calculations and/or critical data transfers to be carried out.

24.3.2 The forensic unit shall have a procedure for carrying out checks on critical findings and designate competent individuals authorised to carry out such

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46 See ILAC-G19 [3] section 3.5, however assurance of adequate control of electronic records will also need to be demonstrated.

47 Items should have an identifier which is unique within the organisation rather than simply within the case. Initials and number and/or date is not considered unique and although would not devalue or invalidate the item/exhibit if properly handled, it does add a risk which should be avoided.

48 Primary review is a review which occurs as part of the originally commissioned work by the forensic unit.

49 Including those embedded in spreadsheets.

checks. [50] [51] Where checks on critical findings are carried out, the records shall indicate that each critical finding has been checked and whether it was agreed, or not and by whom and when the checks were performed. The procedure should include a process for resolving any discordant results or findings.

24.3.3 Where the forensic unit has deemed [52] the procedure requires an independent check, the unit should define this level of independence [53] and records should be kept to demonstrate this.

24.3.4 The forensic unit shall, when such reviews are undertaken, have documented policies and procedures for the administrative review [54] of case records including reports. The administrative review shall establish that the records/reports comply with the forensic unit's policies with regard to administrative content and structure of such records.

24.3.5 The forensic unit shall have documented policies and procedures and authorised practitioners for the peer review of case records including reports. The review shall establish from the case notes and discussion with the practitioner that the work carried out is:

a. Appropriate to the requirements of the case;

b. Fully documented in the case notes, with appropriate checks on critical findings, calculations, and data transfers;

c. In compliance with the forensic unit's documented policies and procedures; and

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50 The forensic unit may identify individuals external to the unit to conduct critical findings checks.

51 The forensic unit shall demonstrate the competence of persons conducting critical findings checks (e.g. inclusion in the forensic unit's proficiency trials), this includes persons external to the unit if they perform this role.

52 For instance, this determination may be at the identification of end-user requirements in the validation study.

53 ILAC-G19 [3] section 4.7.5 requires this check to be conducted without knowledge of the original result where the critical findings check is the only quality control. For review of case records and reports the review should be by a practitioner who was not involved in the work being reviewed.

54 A review to establish that the records/reports comply with the forensic unit's policies with regard to content and structure of such records.

d. Consistent with the contents of the report.

24.3.6 In all reviews, the case record shall indicate that the review has been carried out, by whom and when.

24.3.7 The checks and reviews shall be recorded as entries against each finding or on a summary of findings or on a report, as appropriate.

24.3.8 If the checker/reviewer disagrees on any point and the matter cannot be resolved, records of the disagreed content, the reason(s) for the disagreement, and any action taken as a result shall be recorded.

Difference Resolution

24.3.9 The review or primary checking process may lead to a difference of opinion between the initial and reviewing practitioner. The forensic unit shall have a documented procedure for resolving or reaching a conclusion in such cases.

24.3.10 The procedure noted in section 24.3.9 shall ensure the obligations in relation to disclosure to the CJS are discharged [21].

25. Internal Audits

25.1.1 The annual audit programme shall cover all aspects of the management system. This shall include, but not be limited to:

a. Implementation of the management system, including the implementation of technical methods;

b. Records of individual files; and

c. Security and integrity of information and data (also 30.3 - Electronic Information Security).

25.1.2 A risk assessment-based approach should be taken to determine the frequency of the audit schedule, and this should be documented, but methods shall be audited at least once every four-year cycle. [55]

25.1.3 Where the forensic unit undertakes to make statements of opinions and interpretations, the audits shall include a review of the process by which these are made and of the competence requirements of the individuals authorised to make such statements.

25.1.4 Where examination and testing activities are delivered from a number of different operational sites, the internal audits shall cover all sites and all aspects of the management system.

25.1.5 When the results of the audit cast doubt on the effectiveness of examinations, or the correctness or validity of the forensic unit's results to the extent that misleading information may have been reported, the forensic unit shall treat the audit result as a non-conforming result.

26. Personnel Requirements

26.1 General

26.1.1 The forensic unit shall ensure appropriate background checks (e.g. security checks) have been completed on all candidates for employment and contractors in accordance with relevant laws, regulations, and ethics. These checks shall be proportional to the business requirements, the classification of the information to be accessed, and the perceived risks. [56] The forensic unit shall ensure appropriate security clearance is maintained by all staff and contractors.

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55 The frequency of audits should take account of the length of time (and stability of) the quality management system has been in place, the size of the organisation, the complexity of the work being audited, the frequency of use of specific technical methods or procedures, and the potential consequences of noncompliance with the requirements. The value of occasional unannounced audits should also be considered.

56 The required level of clearance for prolonged or unsupervised access to case material is normally Security Check (SC) [149] or Non-Police Personnel Vetting (NPPV) level 3 [158], or equivalent. The clearance level required may, however, be varied in writing by the commissioning party, the controller of the data or the Senior Accountable Individual of the commissioning party (where the party and the forensic unit are part of the same organisation).

26.1.2 The commissioning party shall be notified of the level of background checks held in the forensic unit by staff with access to the data and items/exhibits to allow a determination of whether the level is acceptable during the review of requests, tenders and contracts (see section 21 - Review of Requests, Tenders and/or Contracts).

26.1.3 The contracts for all staff, permanent and temporary, shall contain confidentiality agreements[57], setting out their own and the forensic unit's responsibility for information security, and details of their expected conduct.

26.2 Standards of Conduct

26.2.1 The forensic unit shall have a Code of Conduct compatible with the Standards of Conduct provided in section 14. Practitioners shall be made familiar with how the Code of Conduct relates to their role in the administration of justice and details of how this was achieved shall be recorded.

26.2.2 There is no specific requirement for familiarisation with the Standards of Conduct for personnel not directly conducting any aspect of an FSA, supporting the delivery of FSAs, or with legitimate access to examination areas, items, or records. However, such personnel should be made familiar with relevant issues to their role and access permissions such as security, continuity, contamination control, security and confidentiality requirements as set out in 26.1.3.

26.3 Competence

General

26.3.1 The forensic unit shall determine and document the requirements for competence and ongoing competence for each role, as set out in section 16, including the competencies required for reporting findings.

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[57] The confidentiality agreements should cover the intellectual property of the forensic unit and all information relating to casework and shall not conflict with any disclosure requirements.

26.3.2 The forensic unit shall determine the appropriate competence framework for practitioners [58], this should include the following.

a. Education.

b. Qualification.

c. Training.

d. Technical knowledge.

e. Skills and experience.

f. The nature of the competence assessment.

g. The frequency of reassessment of competence.

h. Whether observation of any testing or inspection work is required, and if so, the frequency of this.

26.3.3 The forensic unit shall have processes to address the following.

a. Remedial actions when competence is found to have lapsed or not been demonstrated. See also 23.1 - Control of Non-Conforming FSA Related Work.

b. Remedial actions required should there be an event which undermines the credibility of a practitioner or the forensic unit. Such events may include, but not be limited to, the following.

i. Judicial criticism.

ii. Complaints.

iii. Criticism by a professional body.

iv. Criticism by the Regulator.

Competence Required for Reporting

26.3.4 Forensic units shall ensure that all practitioners who report factual evidence based on scientific methodology are aware of the following.

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[58] This may be a locally or nationally devised framework.

a. Whether there is any relevant specialist literature relating to the field;

b. That the principles, techniques and assumptions they have relied on are valid;

c. Where factual reporting in the FSA ends, and where evidence of opinion begins;

d. That they must be able to demonstrate that the assumptions they have relied upon are reasonable; and

e. The impact of the uncertainty of measurement associated with the application of a given method.

26.3.5 Forensic units shall ensure that all practitioners who provide reports have a sufficient level of skill, experience, knowledge, and, where appropriate, qualifications, relevant to the type of evidence being adduced, to give credibility to the reliability of the work undertaken and the conclusions drawn. Practitioners shall also ensure that they are able to explain their methodology and reasoning, both in writing and orally, which should be concise in a way that is comprehensible to a lay person and not misleading.

26.3.6 In determining competence, the forensic unit shall consider whether any issues, other than those listed in section 26.3.5, would call into question the competence of an otherwise apparently suitable individual. Relevant issues include, but are not limited to, the following (if upheld).

a. Adverse judicial comments.

b. Adverse findings by the Regulator.

c. Adverse findings by professional or regulatory bodies.

26.3.7 Forensic units shall ensure that all practitioners who provide evidence including opinion based on their practical experience and/or their professional knowledge are additionally able to provide: [59]

[59] Also see the list included in the Criminal Practice Directions V (19A.5c) [27].

a. An explanation of their methodology and reasoning;

b. Reference to a body of up to date specialised literature relating to the field of expertise and the extent to which this supports or undermines their methodology and reasoning;

c. An assessment that any database they have relied on is relevant and sufficient in size and quality to justify the nature and breadth of inferences drawn from it, that the inferences are logically sound and that alternative hypotheses in the investigative mode and alternative propositions in the evaluative mode have been properly considered;

d. A demonstration that their methodology, assumptions, and reasoning have been considered by other scientists and are regarded as sound, or, where challenged, the concerns have been satisfactorily addressed;

e. An assessment of the extent to which their methodology and reasoning are accepted by their peers, together with details of any outstanding concerns;

f. Relevant information to support claims of expertise, as well as anything that may adversely affect credibility or competence (e.g. adverse judicial findings); [26] [60] and

g. The statement of understanding and truth in expert reports for the CJS in England and Wales, as required in Criminal Practice Directions V 19B (see 36.1.10 and Criminal Practice Directions v 19B.1.13) [27].

26.3.8 Expertise cannot be simply measured in years, number of cases examined, educational achievements, post-nominals, or seniority, nor is it equivalent to credibility. The broad range of case circumstances encountered in any discipline of forensic science means that a particular expert will have more relevant skill, experience, and expertise in some cases than in others.

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[60] Note the Criminal Procedure Rules 19.3-(3c) [35] requires experts to provide “notice of anything of which the party serving it is aware which might reasonably be thought capable of detracting substantially from the credibility of that expert.” This provision applies to experts regardless of the source of commission.

a. The competence of each expert shall be assessed in each discipline in which they claim expertise, and thereafter monitored at appropriate intervals.

b. To comply with their obligations under Criminal Procedure Rules (CrimPR) 19.4 (b) and (f), experts should remain up to date with their knowledge of the scientific literature relevant to their field.

c. Experts should participate in regular evaluation of their expertise [28] [29] through, for example, proficiency tests that are representative of the complexity encountered in casework.

26.4 Competence Records

26.4.1 The forensic unit and/or individual practitioners conducting FSAs shall maintain, and keep readily available, records of education, training, skills, and experience in sufficient detail to provide evidence of proper training and formal competence assessment. [61] These records shall include, but not be limited to:

a. Academic and/or professional qualifications;

b. Internal/external courses attended;

c. Relevant training/retraining received whilst employed by the forensic unit;

d. Any subsequent remedial action from any substantive complaints, errors, or adverse judicial comments;

e. Any substantive accolades, commendations, etc. pertinent to skills and experience;

f. The tasks for which the individual has been assessed as competent and authorised to carry out;

g. The date(s) on which competence and authorisation were confirmed; and

h. The date(s) on which competence and authorisation lapsed or were removed.

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[61] This may include records of continuous professional development.

26.4.2 The manner in which competence is achieved, demonstrated, and maintained shall be documented, and the forensic unit shall have a policy for retention of training manuals, training and competence assessment records in line with the policy for retention of case files.

27. Environment where the FSA is Undertaken

27.1 Examination Facilities

27.1.1 An examination facility is one where appropriate environmental conditions can be achieved and maintained for the optimum performance of a given technique. Such a facility is not necessarily at a fixed location and may include dedicated mobile facilities. A scene of an incident, and the vehicles used solely for transporting persons and their equipment, are not examination facilities in this context as each is an uncontrolled environment.

27.1.2 The examination facilities shall include, as appropriate (to the work being undertaken):

a. Suitable accommodation, appliances (e.g. laboratory benches, safety cabinets, refrigerators, freezers) and space (per employee) to carry out the work to the required standard safely and without contamination;

b. Provision of appropriate environmental conditions (e.g. lighting, temperature, humidity, ventilation/air flow) required to facilitate correct performance of examinations or tests, and not adversely affect the required quality of any measurement or invalidate results;

c. Proportionate protection against likely risks, such as arson, theft, or interference with items/exhibits;

d. Archive/storage facilities with adequate storage conditions to prevent loss, deterioration, and contamination, and to maintain the integrity and identity of documents/records/items/exhibits before, during, and after examinations or tests have been performed; and

e. Facilities for the secure disposal of confidential waste and the safe disposal of hazardous materials.

Dedicated Facilities

27.1.3 The access and use of item/exhibit storage areas and server rooms should be controlled in addition to areas where work is carried out. The forensic unit shall hold on record a list of all staff who are authorised to enter these areas. This shall be reviewed regularly and updated where appropriate.

27.1.4 Delivery and loading areas, and other points where unauthorised persons may enter the building, shall be isolated from casework and information processing areas and access shall also be controlled. Unauthorised persons needing to enter controlled areas shall be escorted at all times by authorised staff and a record of these entries shall be maintained.

Non-Dedicated Work Areas

27.1.5 It is recognised that, other than for traditional laboratory work with inherent need for contamination control, the forensic unit may authorise parts of the FSA to be performed in a place that is not dedicated or primarily designed for that purpose (e.g. home working). [62] Where the forensic unit is expected to hold accreditation for performing the FSA, the forensic unit shall consult with the accreditation body prior to authorisation to ensure all implications are considered, and any impact on the forensic unit's accreditation status has been assessed.

27.1.6 The forensic unit shall also consider and record, prior to authorising, where the FSA is being conducted, and how the security of the information and the integrity and identity of documents/records/test items/exhibits is maintained before, during and after examinations or tests have been performed.

27.1.7 The risk assessment required in 30.1.2 should be used to identify the critical control points and the controls to be maintained and may be used in the authorisation process.

27.1.8 The forensic unit shall document the controls being used, even if normal good practice requirements such as clear desk policies, restricting the amount of

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62 Road vehicles recovered to a third-party facility are treated under the incident scene examination FSA, and this section does not apply. If a different FSA is needed, then the conditions of that FSA apply.

information held off site, or any other generic mitigation steps the practitioner apply. The forensic unit shall identify how it will assure compliance and/or include within its internal audit.

27.2 Contamination Avoidance, Monitoring and Detection [30] [31] [32]

General

27.2.1 The forensic unit shall have policies and procedures relevant to the nature of the casework for the prevention, monitoring, and detection of contamination that could interfere with the analyte of interest to be tested for.

27.2.2 The steps in establishing procedures relevant to data 'contamination' control are detailed as data integrity issues in section 30.1 which includes a similar hazard or risk-based analysis of the entire method as is detailed in 27.2.2 a-e for trace evidence. The remainder of this section refers to trace evidence; for trace evidence the steps shall include [63] but not be limited to:

a. Conducting a hazard or risk-based analysis of the entire method with respect to contamination (e.g. process mapping);

b. Identifying critical control points in the process where contamination events could occur (e.g. consumable selection, transfers, etc.) and for these critical control points:

i. Establish acceptable contamination control limits at each point;

ii. Establish monitoring requirements (e.g. frequency); and

iii. Establish preventative and corrective actions (e.g. when acceptable or control limits are found to be exceeded).

c. Establishing effective methods for both routine and deep cleaning/decontamination of equipment, facilities and surfaces;

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63 With new methods involving data or digital media, steps in establishing procedures relevant to data contamination control shall include 27.2.2 a, b, and e, although if items/exhibits are likely to also require trace evidence analysis this should be conducted first, or all these issues may still apply.

d. Establishing requirements for record keeping; and

e. Establishing procedures for verifying that the contamination control process remains fit for purpose.

27.2.3 The processes and procedures for the management of contamination for trace evidence shall also include, but not be limited to, consideration of the following.

a. Limiting and recording, and where necessary preventing, access by internal and external visitors to any areas where FSAs are undertaken where any recent activity by the visitor relevant to the FSA being undertaken could have an adverse effect on that FSA. Such activity could include, but not be limited to:

i. Incident scene attendance;

ii. Examination of complainant and/or suspect (e.g. for the purposes of taking samples);

iii. Prisoner handling; and

iv. Handling of, or exposure to, relevant materials (e.g. firearm and drugs).

b. Effective separation [64] of incompatible activities to prevent cross-contamination. This includes, but is not limited to, the handling of:

i. Un-amplified and amplified DNA;

ii. High and low-level drugs work;

iii. Toxicology work involving samples likely to have high and low levels of drugs;

iv. Examination of firearms and firearm discharge residues;

v. Examination of accelerant and fire scene debris; and

[64] The extent of physical separation will dictate if objective evidence is needed to demonstrate effectiveness; for instance, a different facility versus simply an adjacent room with potentially shared access routes or service such as air conditioning will require different approaches. However, if temporal separation is the intention, then objective evidence to show the effectiveness of the approach is expected.

vi. Examination of items/exhibits from suspects, complainants, and scenes. [65]

c. Policy on use of disposable equipment in specified areas and/or performing specific FSAs (e.g. gloves, face masks and mop caps).

d. Testing of consumables and chemicals in all stages of the examination/analytical processes and, where appropriate, testing for specific contaminants that could interfere with the success or interpretation of the examination or test (see also 27.2.2).

e. Good working practices, such as:

i. Protecting items/exhibits in wrapping/containers when not being worked on or used;

ii. Using only new or suitably cleaned equipment to remove solvent, standard, or reagent from stock bottles;

iii. Not pouring unused portions of solvent, standard, or reagent back into bulk supplies; and

iv. Frequent changing of solvent used for rinsing equipment.

f. Good housekeeping practices.

g. The selection and analysis of blank controls.

h. Environmental sampling/monitoring with particular reference to acceptable levels of relevant potential contaminants. This should include equipment, work areas, consumables, and clothing to ensure that any contamination of accommodation and/or equipment that does occur is recognised and controlled.

i. Using methods for both routine and deep cleaning/decontamination which include consideration of the following:

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[65] The same practitioner should not examine the complainant and a suspect in relation to the same alleged incident, within the same shift. Where this is not possible, this should be documented, and an explanation provided; measures taken to minimise the potential for cross-contamination shall be documented.

i. The nature of contaminants relevant to the operation of the FSA and/or the forensic unit;

ii. Work surfaces, walls, doors, flooring, ceiling, ducting, other fixtures and fittings and the likely vectors of contaminant transmission;

iii. The materials/chemicals appropriate for use in contamination control;

iv. Appropriate training and competence of staff deployed in cleaning/decontamination processes; and

v. Governance and oversight by senior management.

27.2.4 The policies and procedures shall ensure access to areas, other than scenes of incidents, where FSAs are undertaken is restricted to authorised individuals.

27.2.5 The forensic unit shall identify areas of work, including scenes of incidents, where personnel are required to provide samples, for elimination databases relevant to the nature of the work undertaken in areas they access (e.g. biological material/DNA recovery and analysis, friction ridge detail recovery) and any results found in casework screened. These databases may be locally or remotely maintained.

27.2.6 Policies and procedures for elimination databases of staff, internal/external visitors, and equipment suppliers should include, but are not limited to:

a. Reporting policies;

b. Data formats;

c. Searching policies;

d. Validation of searching procedures;

e. Security and access;

f. Retention periods;

g. Sharing agreements (i.e. between forensic units);

h. Agreements/consents; and

i. Release forms.

28. Methods and Method Validation

28.1 General

28.1.1 All technical methods and procedures used by a forensic unit shall be fit for purpose, this is demonstrated by method validation.

28.1.2 This involves establishing that the method operates in the expected manner, that the limitations of the method are properly understood, that the planned use of the method is appropriate, and that the approach to reporting is logical.

28.1.3 Validation allows a proper understanding of the risks involved in the use of a method.

28.2 Selection of Methods

28.2.1 This section details the principles of the requirement for validated methods, the next section, 28.3 - Validation of Methods, details the required processes.

28.2.2 Even where a method is considered standard and is in widespread use, scientific validity will still need to be demonstrated. The topic of verification of the validation of adopted methods is discussed below, although many of the other validation steps are likely also to apply. If a method is being newly included in the forensic unit's scope of accreditation and validation has not been conducted at the laboratory site where it is to be implemented, the forensic unit will have to follow the adopted methods procedure, which ends in the production of a validation library and statement of completion as well as demonstrating the method works in their hands.

28.2.3 If a method requires the use of portable equipment (i.e. equipment intended to be used at different locations) for any reason, the validation study shall include testing any additional controls as well as assessing any additional aspects that may impact on the tests. For ISO 17020 [2] applications see, for example, Process Requirements section 7.1.1 in UKAS-RG 201 [17] (including, but not limited to temperature, humidity, surfaces, cross reactivity, lighting, cross contamination control, handling controls).

28.2.4 The forensic unit should have validated the method (including the equipment) prior to use in casework in accordance with the requirements of this Code. If the

implementation plan requires a period of pilot after the validation study for the validation to be considered complete, such as might be the case for novel [66] techniques, non-routine, or infrequently used methods, or if there is any other deviation from the validation requirements set out in this Code, the forensic unit should ensure that the status of the validation for the product, method, or service is clearly understood by the commissioning party prior to agreeing use in casework.

28.3 Validation of Methods

28.3.1 The forensic unit shall use methods of demonstrable validity (see the Standards of Conduct in section 14).

28.3.2 Validation should be conducted prior to implementation of the method. This may be performed in its entirety by the forensic unit, or the studies to produce the data may be performed by the manufacturer or another forensic unit; in which case the forensic unit implementing the method shall review the data to determine if it is adequate, reliable, and relevant to the purpose it intends for the method (see Verification of the Validation of Adopted Methods 28.3.41 to 28.3.47).

28.3.3 If the validation has not been conducted at the site that will be using the method, the forensic unit shall verify the scope of the validation with the required steps in 28.3.7; except where the method has been validated for incident scene use and is being used at an incident scene (see, for example, UKAS-RG 201 [17]). This may be scaled up or down according to the adequacy and relevance of the available existing validation study. In such cases, following review of validation data to determine if the validation is adequate, the forensic unit's practitioners trained and signed off as competent in the method shall

[66] Major breakthroughs, novel uses of existing science, or significant changes might warrant wider stakeholder consultations. In these cases, it would be useful to inform the Regulator, who may advise on the most expedient method of ensuring that the CJS requirements are understood.

demonstrate such adopted methods perform reliably at the given location by following the validation process. [67] [3] [33] [34]

28.3.4 The validation policy or procedure shall set out roles and responsibilities of practitioners involved in conducting validation, authorisation of key stages, and reviewing outcomes.

28.3.5 To ensure validation studies are conducted on the final method, there should be a clear boundary between development and validation. It is important that any significant unexpected outcomes are not corrected during validation, but that the method is declared to have failed validation. Following such a failure either:

a. The method shall be abandoned; or

b. The method shall be amended (if that is possible while maintaining the required standards), and validation repeated. [68]

28.3.6 If a method is amended during validation, then the validation is invalid. The procedure should include consideration of how to prevent inadvertent re-entering of the development process once validation has started.

28.3.7 The validation procedure shall include where relevant, but is not limited to:

a. Determining the end-user's requirements;

b. Determining the specification;

c. Risk assessment of the method;

d. A review of the end-user's requirements and specification;

e. Setting the acceptance criteria;

f. The validation plan;

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[67] See ILAC-G19 [3] (3.10): "When a method has been validated in another organization the forensic unit shall review validation records to ensure that the validation performed was fit for purpose. It is then possible for the forensic unit to only undertake verification for the method to demonstrate that the unit is competent to perform the test/examination." This Code expects the review to be against the end-user's requirements with the production of the statement of validation completion see section 28.3.66.

[68] Should validation need to be repeated, consideration of whether using the same dataset or item introduces a potential risk of optimising the method to the validation sample set itself, so separation of stages in name only.

g. The outcomes of the validation exercise;

h. Assessment of acceptance criteria compliance;

i. Validation report;

j. Statement of validation completion; and

k. Implementation plan.

28.3.8 In certain circumstances implemented methods will require revalidation, e.g. when:

a. Quality control indicates that an established method is changing with time;

b. Equipment that was not validated to be mobile or portable is moved to a new location;

c. Deficiencies have become apparent after the method has been implemented; or

d. The end-user identifies a change in requirement.

Determining the End-User's Requirements

28.3.9 The process of innovation ending in the implementation of a validated method is more likely to be instigated by the forensic unit than the end-user. However, the requirements of all end users (e.g. other practitioners, investigators, prosecutors, and the CJS) must be considered. To meet the needs of the CJS, the expectations of the court (e.g. Criminal Practice Directions [27] V 19A.5, relevant case law [21]) need to be determined.

28.3.10 The amount of direct input from the CJS end-user should be determined by the forensic unit, based on the type of innovation; certain requirements may be generic and form a set of core requirements to the casework type.

28.3.11 The Criminal Practice Directions V (i.e. 19A.5) [27] that supplement Part 19 of the Criminal Procedure Rules [35] should be considered as providing an insight as to the expectations of the CJS end-user. These expectations apply regardless of whether the result is evidence of fact or opinion.

28.3.12 The end-user's requirement shall take account of, as appropriate:

a. Who will operate or use the new method, product, or service post-delivery, and in what environment;

b. What the new method or product is intended to deliver to the end-user's;

c. What statutory and regulatory requirements related to development and use of the method or product apply;

d. Whether there are any compatibility issues to be considered, e.g. data output formats;

e. What level of quality performance is expected; and

f. By what date the new method, product, or service is required for implementation.

28.3.13 End-user's requirements should conform to the following rules:

a. Each requirement is a single statement;

b. Each requirement is testable;

c. Each requirement specifies something that the solution will do, not how it will do it;

d. Each requirement specifies in its wording whether it is mandatory or desirable; and

e. Each requirement is written in a language that can be understood by the non-technical stakeholders.

28.3.14 Where the method is part of a service to be provided to a specified commissioning party, the forensic unit shall also ensure their formal agreement of the method selection.

Determining the Specification

28.3.15 A detailed specification shall be written for the method and shall include the technical quality standards. It may be an extension of the end-user's requirements document or a separate document.

28.3.16 The specification adds detail to the requirements captured in end-user requirement from the range of users. It also draws in other technical requirements and is ultimately what is to be tested, encapsulating what this

method is to do, the configuration, and what the method can and cannot be used for.

28.3.17 At this stage the list contained in the ILAC-G19 [3] (3.10) should be considered, even if the points listed were not explicitly raised in the end-user requirement capture exercise. The specification may also draw on technical details from a review of the scientific literature.

Risk Assessment of the Method

28.3.18 Once the method has been designed or determined, there shall be an assessment to identify any risks, or potential risks, to the CJS related to the use of the method or amendment to the method, including ad hoc methods. The process shall include, but not be limited to:

a. Identifying, on the basis of the use to which the results may be put, the possible impact on the CJS of any errors in the results, associated materials or procedures; and

b. Identifying areas where the operation of the method, or interpretation of the results, requires specialist skills or knowledge to prevent ambiguous or misleading outputs or outcomes.

28.3.19 The forensic unit should define the risk assessment method it will use. This Code requires risk assessment in various sections including in contamination (see section 27.2.2) and control of data (see section 30.1.2). The methodology recommended in both is based upon process mapping and identifying the critical control points for the risks or failure modes [69] at those stages. One process map may be used to cover the whole method against different risks, and may be used to evaluate, or at least identify, potential contributions to uncertainty.

28.3.20 Where the method relies on a scientific model or theory, the risk assessment should address the following in a forensic science context:

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69 Examples of how Failure Mode Effect Analysis may assist are included in guidance published by the Regulator. [33]

a. The validity of the theory/model;

b. Any assumptions incorporated within the theory/model; and

c. Limits on the application of the theory/model.

28.3.21 In light of the assessment there shall be recommendations for modification of the specification, specific studies to be included in the validation exercise, or additional procedures and/or safeguards that should be implemented. Examples would include, but not be limited to:

a. Caveats about the use of the method;

b. Circumstances in which the use of the method would be inadvisable; and

c. Additional work that should be undertaken in combination with the method.

28.3.22 Where items/exhibits provided by an end-user, or data derived from these, are required for the development work or validation, the forensic unit shall obtain prior permission, from those with responsibility for the items and/or data (e.g. the commissioning party or prosecuting authority) for their use and include their use in the risk assessment. [36] Given the risks involved in the use of casework items/exhibits and/or data, the Senior Accountable Individual for the forensic unit shall be informed of the proposed use.

28.3.23 The risk assessment shall be subject to version control and should feed into the statement of validation completion.

Review of the End-User's Requirements

28.3.24 The forensic unit shall review the requirements collated to ensure that requirements considered essential/mandatory have been translated correctly into the specification and the specification is fit for purpose. Where appropriate, the end-user's specifying the requirement may be involved in this review process.

28.3.25 When a review identifies that there are risks, or that there are compatibility, legality, or ethical issues, the forensic unit shall produce a revised end-user's requirements and/or specification.

28.3.26 Any subsequent changes to the specification shall then be only made in line with the forensic unit's change control procedures and only following further review and acceptance of the impact of the changes by the intended end-users.

28.3.27 The forensic unit shall ensure that all practitioners involved in the development and validation/verification of the method are informed of any agreed changes to the end-user's requirements or specification.

The Acceptance Criteria

28.3.28 The acceptance criteria shall be established in advance of the validation and should be clearly stated, based upon the specification, the risk analysis, and any control strategies put in place to control identified risks.

28.3.29 The acceptance criteria shall be used to demonstrate the effectiveness of the method and control strategy within measurable and set tolerances.

The Validation Plan

28.3.30 The validation shall be carried out according to a documented validation plan. The validation plan shall identify and define the functional and performance requirements, the relevant parameters and characteristics to be studied, and the acceptance criteria for the results obtained to confirm that the specified requirements for the method, product, or service have been met.

28.3.31 Where appropriate, the validation plan shall also include a requirement to check the relevant parameters and characteristics of the procedures for sampling, handling, and transportation. The same level of confidence in the results obtained shall be required whether the method is to be used routinely or infrequently.

28.3.32 The validation shall be carried out using simulated casework material in the first instance and subsequently, where possible, permitted, and appropriate, with actual casework material to confirm its robustness. [70]

28.3.33 The validation plan should be tailored depending on whether, for example, it is intended for the:

a. Validation of measurement-based methods;

b. Validation of interpretive methods;

c. Verification of the validation of adopted methods; and/or

d. Verification of the impact of minor changes to methods.

28.3.34 The validation plan should be signed off by a suitably competent individual who was independent from the development of the method and has sufficient knowledge of the relevant field under study.

28.3.35 Where this is a plan for the validation of a new method rather than an adopted method (see 28.3.9), it is accepted additional individuals may be needed to provide the necessary breadth of technical knowledge to evaluate the plan. [71] In such cases these individuals shall be listed in the validation report and their role in supporting the person responsible for sign-off should be recorded.

Validation of Measurement-Based Methods

28.3.36 The validation plan should ensure the required parameters and characteristics are studied:

a. By a practitioner competent in the field of work under study, who has sufficient knowledge of the work to be able to make appropriate decisions from the observations made as the study progresses; and

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70 Legal advice may be required for the use of casework material where the exemption in relevant legislation 'for law enforcement purposes' may not apply. Validation studies on casework material generates disclosure requirements and a protocol with guidance on the issue of handling differences between results obtained with existing and the new methods. [36]

71 Good experimental design ensures the study tests the features required and can reduce the overall experimental effort.

b. Using equipment that is within specification, working correctly and, where appropriate, calibrated.

28.3.37 The functional and performance requirements, and the relevant parameters and characteristics for measurement-based methods [72] that shall be considered include the following.

a. Competence requirements of the practitioner.

b. Environmental constraints.

c. Item/exhibit and/or sample size.

d. Item/exhibit and/or sample handling.

e. Results are consistent, reliable, accurate, robust, and with an uncertainty measurement.

f. Compatibility with results obtained by other practitioners using different equipment and different methods.

g. Limitations of applicability.

28.3.38 For contact trace material, the following additional functional and performance requirements, and the relevant parameters and characteristics for measurement-based methods [73] shall be considered include the following.

a. Item/exhibit and/or sample homogeneity.

b. Ability of the sampling process to provide a representative sample of the item/exhibit.

c. Efficiency of recovery of the substance(s) to be identified/measured (i.e. analyte) during sample preparation for analysis.

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[72] The applicability of the parameter should be considered against the aim and the nature of the test. Determining a limit of quantification 28.3.38f may be evaluated as not applicable in an entirely qualitative test, but there may still be a requirement to estimate the uncertainty (see 29 - Estimation of Uncertainty).

[73] The applicability of the parameter should be considered against the aim and the nature of the test. Determining a limit of quantification 28.3.38f may be evaluated as not applicable in an entirely qualitative test, but there may still be a requirement to estimate the uncertainty (see 29 - Estimation of Uncertainty).

d. Presence or absence of the analyte(s) of interest in the sample analysed.

e. Minimum quantity of each analyte that can be reliably detected.

f. Minimum amount of each analyte that can be accurately quantified.

g. Identification/measurement relates to the analyte(s) alone, and is not compromised by the presence of some matrix or substrate effect or interfering substance.

Validation of Interpretive Methods [74]

28.3.39 The functional and performance requirements for interpretive methods are less prescriptive than for measurement-based methods although should include testing against representative ground truth data. [75] They concentrate on the competence requirements for the practitioners involved and how the practitioners shall demonstrate that they can provide consistent, reproducible, valid, and reliable results that are compatible with the results of other competent practitioners. This may be achieved by a combination of:

a. Independent confirmation of results/opinions by another competent practitioner (i.e. without prior knowledge of the first result/opinion provided);

b. Participating in inter-laboratory comparisons (collaborative exercises or proficiency tests); and

c. Designing frequent in-house assessment into the process using positive and negative competence tests.

28.3.40 An interpretive method shall require only the relevant subset of the parameters and characteristics for measurement-based methods to be determined.

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74 Examples of interpretive methods may include the comparison of marks, handwriting, microscopic comparisons etc.

75 Examples of data where the truth is known (not inferred) include datasets created from known donors of samples or call data records created by staged calls at specific coordinates.

Verification of the Validation of Adopted Methods

28.3.41 Verification is defined as confirmation, through the assessment of existing objective evidence or through experiment, that a method, process or device is fit (or remains fit) for the specific purpose intended.

28.3.42 Each of the steps of the validation process are to be completed (i.e. as detailed in 28.3.7), whether the user is producing the objective evidence for relevance, reliability and completeness themselves or objectively reviewing data produced by others. [76] The required end-user requirement and specification form the purpose that the forensic unit is assessing against. If a specification is being also adopted from elsewhere, this should be assessed for suitability for the forensic unit's requirements also.

28.3.43 The assessment to identify any risks, or potential risks, to the CJS related to the use of the method or amendment to the method should be included. If the method is to be deployed in a different manner than the study that provided the data the forensic unit intended to review the specification against, the differences require to be risk-assessed and may prompt a fuller validation study.

28.3.44 Where the validation has not been conducted at the site [77] that will be using the method, the forensic unit must verify the scope of the validation with the study scaled up or down according to the adequacy and relevance of the available existing validation study.

28.3.45 The amount of work required to be carried out in verification exercises when introducing methods developed and validated elsewhere, shall take account of the adequacy of the available existing validation data and the familiarity and experience within the forensic unit of the techniques, equipment, and facilities involved.

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[76] External developers of methods or tools are encouraged to conduct their developmental validation exercises in a comparable manner to the requirements set out in this Code, as well as making the data available.

[77] See UKAS RG 201 for methods intended for incident scene use. [17]

28.3.46 The forensic unit shall check its performance against the specification for the method it is required to produce rather than simply against existing published data, as the requirements may differ.

28.3.47 The validation report shall have as a minimum a summary of the experimental work/review, results, specification used in the review, the risk assessment, practitioner training/competence requirement, and assessment plans. The required validation library and statement of validation completion shall be produced.

Minor Changes in Methods

28.3.48 Replacing like-for-like equipment [78] or minor changes to methods used by the forensic unit may not always require a full revalidation exercise. The impact of the change shall be risk assessed, verified against the original validation and authorised in line with other validation studies.

28.3.49 A revalidation exercise shall be carried out when changes are assessed to have the potential to influence the results obtained.

Infrequently Used Methods

28.3.50 Infrequently used methods pose a challenge in maintaining competence and capability for any FSA. While the use of such methods is acceptable there need to be appropriate safeguards.

28.3.51 Methods used less than once in every three-month period across a legal entity may be considered to be infrequently used. However, the forensic unit may decide not to treat a method, which falls within the definition, as an infrequently used method.

28.3.52 All methods used by the forensic unit, including infrequently used methods, shall have been validated in line with this Code and the forensic unit shall demonstrate competence to perform the method prior to implementation or use.

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[78] Replacing the same make and model may still need some assessment as minor modifications, including software and firmware, might affect the operation.

The validation, verification, or re-verification shall include the steps in 28.3.7 and, as with all methods, a validation library is required. [79]

28.3.53 Forensic units shall have a procedure to identify infrequently performed methods and their maintenance or use including the following.

a. The definition of infrequently performed method;

b. Responsibility for confirming the validation or verification remains appropriate;

c. How competence will be maintained or is demonstrated, ILAC G19 [3] recommends:

i. Regular use of control samples even when casework samples are not being analysed; or

ii. Re-verification before the examination/test in question is performed on a casework sample involving at least the use of an appropriate reference material, followed by replicate examination/testing of the real sample.

d. The sign-off procedure for use in casework including justification of method choice; and

e. How the status of the method will be described in reports.

28.3.54 The manner in which infrequently used methods are dealt with in relation to accreditation is considered in section 39.2.

28.3.55 Infrequently used methods may be maintained on the forensic unit's schedule of accreditation through regular use of mock casework, competence assessments, and any other measures agreed with the accreditation body. [37] In order to be retained within the schedule of accreditation, UKAS requires each aspect of the FSA included in the schedule of accreditation to be assessed at least once

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79 As with all validations the study should be scaled according to user requirement and case circumstances the adequacy and relevance of the available existing validation study, however the forensic unit must still verify the scope of the validation with the required steps in 28.3.7, even if these are brief.

within the four-year accreditation cycle and details the requirements in its publication TPS 68 [37]. [80]

28.3.56 If not included on the schedule of accreditation, then the methods shall be re-verified in accordance with the requirements of this Code prior to each use in casework (see 28.3.53 as well as ILAC G19 [3]), unless the analyte and/or item under test cannot be reproduced (e.g. a destructive chip-off procedure in digital forensics). In these rare events, the risks shall be assessed and the deviation from the Code requirement documented and disclosed in the report. If these activities are to become part of the routine activities of the forensic unit (i.e. used more frequently than once every three months), and the FSA requires it, accreditation shall be sought and obtained by the date set in the FSA definition.

Validation Outcomes

28.3.57 A summary of the outcome of the validation exercise shall be included in the validation report, which shall normally be retained for 30 years after the last use of the method. A full record of the validation exercise will normally be retained by the forensic unit for a similar period, but as a minimum shall be maintained for the functional life of the method and shall include:

a. The authorised validation plan and any subsequent changes to the plan, with justifications and authorisations for the changes;

b. All experimental results from the validation exercise;

c. A detailed comparison of the experimental results with the specified requirements;

d. Independent evaluation of the extent to which the results obtained conform or otherwise to the specified requirements;

e. Any corrective actions identified; and

f. Independent approval of the validation. [81]

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80 Other accreditation bodies may have similar requirements.

81 The same person may carry out both the independent evaluation and the independent authorisation, if competent to do so.

Assessment of Acceptance Criteria Compliance

28.3.58 The independent evaluation of compliance of the experimental results with specified requirements shall be carried out by a person (or persons) not involved in the development of the method or conducting the validation process.

28.3.59 The person(s) shall have demonstrated they have sufficient knowledge of the issues involved to be able to identify and assess the significance of any deficiencies. [82]

28.3.60 The independent authorisation shall typically establish whether:

a. The validation work is adequate and has fully demonstrated compliance of the method with the acceptance criteria for the agreed specification; and

b. The method is fit for its intended use.

28.3.61 If the forensic unit were to plan to implement methods rated as high risk and/or likely to attract challenge once implemented, the Regulator should be consulted as to the need for any wider review and/or publication prior to implementation.

Validation Report [83]

28.3.62 The forensic unit shall produce a validation report in sufficient detail to allow independent assessment of the adequacy of the work carried out in demonstrating that the method, product, or service conforms to the specification and is fit for purpose. The report need not contain all the experimental data, but a summary of this data shall be provided, and the raw data shall be available for inspection if required.

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82 The person(s) may be employed by the forensic unit, contracted by the forensic unit to carry out the evaluation, or be wholly independent of the forensic unit. If employed by the forensic unit, the evaluator/authoriser would need to be able to demonstrate the appropriate level of independence.

83 Forensic units with methods within the schedule of accreditation, on or before 1 November 2016, will often only be required to compile the validation library for those specific methods, which contains a validation report in its original format and the comparable information that the end-user requirement and/or specification would contain (i.e. what the method was intended to be able to do). It is good practice to review the completeness of the validation at this stage and take any further steps to ensure that the method can be said to be valid on the basis of the records held.

28.3.63 The content of the validation report shall depend on the type and extent of validation carried out, but as a general guide it should include, as appropriate:

a. A title and unique identifier;

b. A description of the purpose of the method, product, or service;

c. The specification;

d. The name, version number, and manufacturer of any equipment used;

e. The name(s) and signature(s) of the person(s) accountable for the development of the validation processes;

f. The validation plan;

g. The risk assessment;

h. Any authorised changes to the validation plan and justifications for the changes;

i. A summary of the experimental work and outcomes in sufficient detail to ensure that the tests could be independently replicated by a competent person;

j. Details of any review reports produced;

k. Conformity with the acceptance criteria (expected compared with actual results and any pass/fail criteria);

l. Any limitations/constraints applicable;

m. Any related published papers and similar methods in use by the forensic unit;

n. Any recommendations relating to the implementation of the method, product or service; and

o. The date of the report.

28.3.64 The forensic unit shall submit the validation report for review by persons suitably qualified and independent of the validation process; any issues arising should be dealt with expeditiously.

28.3.65 All the required records relating to the development and validation of the method, product, or service shall be archived, together with the means of

accessing the records, and will normally be kept for 30 years following the method's last use in casework. [84]

Statement of Validation Completion

28.3.66 The forensic unit shall prepare a 'statement of validation completion' on the successful completion of a validation exercise. The aim of the statement of validation completion is to provide a short executive summary of the validation steps performed, and key issues identified in the validation including strengths, weaknesses, and limitations. The intention is that the statement will be no more than two sides of A4 paper in plain language. [85]

28.3.67 The approval by the forensic unit on the scope of the validation must be clear.

28.3.68 The forensic unit should provide any further information that would be useful to the CJS. Examples would include, but not be limited to:

a. Caveats about the use of the method;

b. The approved uses of the method, which could be by case type or item/exhibit type;

c. Circumstances in which the use of the method would be inadvisable; and

d. Additional work that should be undertaken in combination with the result.

Validation Library

28.3.69 The forensic unit shall have available a library of documents relevant to the authorisation of the new method through validation or verification. Where the following are not already distinct sections in the validation report, the content of this library shall include, but not be limited to:

a. The specification for the method approved (see Determining the Specification);

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84 The blanket retention period is an alternative to tracking a method's use in casework and applying the correct retention period in accordance with the Criminal Procedure and Investigations Act 1996 [129].

85 List of factors in direction 19A.5 contained in the Criminal Practice Directions. [27]

b. Any associated supporting material, such as academic papers or technical reports that were used to support or provide evidence on the applicability of the method; [86]

c. The risk assessment for the method approved;

d. The validation plan for the method approved;

e. The validation report;

f. The record of approval; and

g. The statement of validation completion.

28.3.70 Where the method implements a scientific theory/model or an interpretation or evaluation model, the library should include a record of information supporting the use of the theory/model.

28.3.71 Where the method relies on reference collections or databases, the nature, access, and their availability should be described.

28.3.72 The information in the library may be disclosable in criminal proceedings [87] and should be prepared with that possibility in mind.

Implementation Plan and Any Constraints

28.3.73 The forensic unit shall have a plan for implementation of methods, products, or services new to the forensic unit. This plan shall address, where relevant:

a. If the revised or new method has the potential to offer new analytical opportunities relevant to revisiting old cases, how will this new capability be communicated to previous commissioning parties to ensure benefits and risks are clearly available for them to evaluate if any action is warranted;

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86 The literature review also ensures the body of knowledge requirement as outlined in R v. Bonython [1984] 38 SASR 45 can be demonstrated as well as supporting the application of direction 19A.5d of the Criminal Practice Directions V [27].

87 Commercial-in-confidence does not override disclosure requirements including those of the Criminal Procedure and Investigations Act 1996 [129] and a refusal to disclose may prevent methods, products, or services being used.

b. The standard operating procedure (including the process for assessment/interpretation/reporting of results) or instructions for use;

c. Requirements for staff training, competence assessment, and on-going monitoring of staff competence;

d. Integration of the method with what is already in place;

e. If the method is intended to be included in the scope of accreditation and what steps are required to achieve this;

f. The monitoring mechanisms to be used to demonstrate that the method remains under satisfactory control during its use;

g. The protocols for calibration, monitoring, and maintenance of any equipment;

h. The supply and traceability of any standards/reference materials;

i. The supply and quality control of key materials, consumables, and reagents;

j. The item/exhibit handling and any anti-contamination protocols;

k. The accommodation plan;

l. Any specific health and safety, environmental protection, data protection, and information security arrangements;

m. The communication plan; and

n. The schedule for post-implementation review.

29. Estimation of Uncertainty

29.1.1 A forensic unit performing testing [88] is required to evaluate measurement uncertainty; testing is the determination of one or more characteristics according to a procedure and although typically quantitative, it can be qualitative (e.g. a presumptive test with a colour change).

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[88] The forensic unit may undertake testing as part of incident scene investigation. ILAC-G19 [3] includes, but does not limit such testing to, quantitative measurements and presumptive or screening tests. Inspection activity that contains testing is expected to meet the relevant requirements of ISO 17025 [1], this includes but is not limited to estimation of uncertainty of measurement (see also ILAC-G27 [159]).

29.1.2 Qualitative testing may be for the presence or absence of a defined analyte but there will be uncertainty associated with the underlying test conditions. Where the test method precludes rigorous evaluation of measurement such as a test that is qualitative in nature, UKAS M3003 [38] states “there will be uncertainties associated with the underlying test conditions and these should be subject to the same type of evaluation as is required for quantitative test results”. ILAC G17 [39] indicates that with qualitative testing or examinations, an estimation of the probability for false positive or false negative test results may be relevant. A method of evaluating contributions to uncertainty may include the method used for risk assessment during the validation of the method (see 28.3.19).

29.1.3 The impact that uncertainty may have on the findings shall be included in both factual and evaluative reports to the CJS where it is relevant.

29.1.4 When a procedure is modified, in addition to any validation or verification, forensic units should also review the measurement uncertainty.

29.1.5 Guidance on the estimation of uncertainty of measurement is contained in Appendix N of the UKAS M3003 publication ‘The Expression of Uncertainty and Confidence in Measurement’. [38] [89]

29.1.6 The Criminal Practice Directions V (19A.5c) [27] which supplements Part 19 of the Criminal Procedure Rules [35] include several factors which should be considered. However, the following direction that the court may take into account in determining admissibility is particularly relevant:

> 19A.5c “if the expert’s opinion relies on the results of the use of any method (for instance, a test, measurement or survey), whether the opinion takes proper account of matters, such as the degree of precision or margin of uncertainty, affecting the accuracy or reliability of those results.”

30. Control of Data

30.1 General

[89] Guidance has also been issued by Eurachem. [124]

30.1.1 The forensic unit shall have procedures within its management system to ensure that all necessary information is recorded accurately, maintained so that its authenticity and integrity is not compromised, and is retained and destroyed in accordance with the forensic unit's retention and destruction policy (see 38 - Retention, Recording, Revelation and Disclosure). [22] [40] [41] [42] This applies within all environments the FSA is performed or output stored, including remote sites such as authorised home-based working environments where FSAs are conducted.

30.1.2 The forensic unit shall perform a risk assessment that should include process mapping and identify critical control stages in the process requiring specific protection steps to prevent loss, corruption, and unauthorised access. This risk assessment may occur during method development, method validation and combined with risk assessments looking at risk of contamination [90], or may be standalone looking at data. The steps included in the risk assessment shall include the following.

a. Identify critical data.

b. Identify critical control points (i.e. places where data is entered, transferred, stored, or processed).

c. Identify hazards to be controlled at the critical control points (e.g. data corruption, errors, media loss, unauthorised access, unauthorised manipulation, or the practitioner having sight of data extraneous to the stage of the activity, i.e. if there is a risk of cognitive bias in the FSA). [91]

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90 This critical control point approach is a risk analysis advocated in this Code for assessing risk of contamination as well as in guidance [23] issued by the Regulator for assessing the risk of cognitive bias. As the process mapping includes information flow, storage and transfer, it is recommended the process mapping is used for assessment of these and other risks in the process at the same time (see also 28.3.19).

91 Should it be required, and relevant, more detailed guidance of the types of risk can be obtained from BS ISO/IEC 27001:2013 Information technology – Security techniques – Information security management [44] systems – Requirements and BS ISO/IEC 27002:2013, Information technology – Security techniques – Code of practice for information security management. [45]

d. Consider all items being tested/exhibits related to the FSA carrying data, or if wider risk assessment is being performed, all items being tested/exhibits.

e. Include technology operated by the forensic unit such as mobile phones, satellite navigation systems, laptops, cameras etc. [92]

30.1.3 The forensic unit shall identify mitigation steps based on the risk assessment to:

a. Minimise the risk of data loss;

b. Minimise the risk of data corruption (deliberate, degraded, actual, or suspected);

c. Control extraneous information;

d. Demonstrate that the results are reliable and analytically sound; and

e. Maintain continuity and prevent unauthorised access to and/or amendment of all electronic records identified by assessment of the critical control points of key data.

30.1.4 In case of nationally provided and managed services (e.g. the Police National Computer) that are outside the control of the forensic unit, the forensic unit shall consider, and document, the risk to the forensic unit and any mitigation introduced to control that risk.

30.1.5 Protection steps shall be tested by sampling of key data. [93]

30.1.6 Whilst these clauses indicate the forensic units, where the forensic unit is within a larger organisation, achieving or demonstrating compliance may require some liaison with the organisation's Information Security/IT departments. The Senior Accountable Individual (SAI) is responsible for ensuring compliance with this Code and should be senior enough to ensure support services in larger

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92 Critical control points include the data transfer off items/exhibits, but here also technology operated by the forensic unit which may contain data.

93 Assessment of what is key data should be risk based, and process mapping to look at data flow through each process and identify critical control points would be an appropriate assessment of what stages in the process require specific protection steps to prevent loss, corruption and unauthorised access.

organisations outside the forensic unit assist compliance and/or demonstration of compliance if required (see 16.2).

30.1.7 The following sections focus on information held in an electronic form. More general requirements that also apply for physical items/exhibits are set out in this Code in sections 20 – Document Control, 24 – Control of Records, 27 – Environment where the FSA is Undertaken, and in section 34 – Handling of Items/Exhibits.

30.2 Electronic Information Capture, Storage, Transfer, Retrieval and Disposal [94]

30.2.1 The forensic unit shall establish procedures for the capture and retrieval of electronic information appropriate for the process or method. If the capture or transformation process does involve any loss or change, this should have been assessed during validation and the acceptance criteria stated (e.g. as defined in the method's end-user requirements, specification, or in the procedure itself).

30.2.2 Where scanning technology is used, the forensic unit shall establish procedures and quality control for the scanning of documents in paper form, microforms, and other forms of information, as appropriate, to ensure that any potential information loss as a result of the scanning is within acceptable limits. [95]

30.2.3 Appropriate to the associated FSA, the procedure and policies should ensure that where key information is extracted from pictorial image files the original images are retained and linked with the captured data, including digital metadata.

30.2.4 Where an electronic document has, for example embedded files or hyperlinks, all relevant parts of the document shall be stored in line with the forensic unit's retention policy along with their content.

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94 Further information and guidance can be found in BS 10008:2014, Evidential weight and legal admissibility of electronic information – Specification. [152]

95 Further information and guidance can be found in ISO 12653-1:2000, Electronic imaging - Test target for the black-and-white scanning of office documents - Part 1: Characteristics. [150]

30.2.5 Critical data should be accessible throughout its period of retention.

30.2.6 When data is migrated from storage media owned or controlled by the forensic unit (i.e. not the submitted item/exhibit) to alternative storage media, the forensic unit shall establish procedures to ensure that all digital objects [96] have been successfully migrated. The digital object and file format of the migrated digital objects should not have changed, or that the changes are known, have been audited, and meet requirements.

30.2.7 If replacement software (e.g. an operating system or application software) is implemented, the forensic unit shall ensure that procedures are established to retain access to any critical data reliant on that software.

30.2.8 Any compression applied to the archival storage of data/information should be fit for purpose; for evidential data this may mean it should be assessed if compression should be mathematically lossless so as not to put into question its data integrity or authenticity.

30.2.9 Data shall be retained according to retention and destruction policy until such time as that policy determines it should be destroyed (see also 38 - Retention, Recording, Revelation and Disclosure). Destruction or disposal of the data, including the method by which that is achieved should be recorded within the audit trail for that data.

30.3 Electronic Information Security [43]

30.3.1 The forensic unit shall have an information security policy which explains how the unit meets its responsibilities outlined in section 30.1. [44] [45] The information security policy shall describe the procedures, based on business and security requirements, as assessed by the forensic unit, for the management of its electronic information. The forensic unit shall ensure procedures are subject to regular testing, audit and review. [97]

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96 A digital object is a discrete digital structure that contains meaningful data.

97 The testing may be conducted by the forensic unit's IT provider, however the responsibility to ensure it occurs and provide evidence of the testing resides with the forensic unit.

30.3.2 The forensic unit's information security policy shall have processes for the following parts of this section.

Access Control to Electronic Information

30.3.3 The access control procedures shall include the identification, authentication, and authorisation of users. Users shall have defined privileges which limit, as far as practical, access to only the information and key operational services they require to perform their roles.

30.3.4 When users leave their role or the organisation, the forensic unit shall ensure access is removed.

30.3.5 Reviews should take place at least every 6 months to determine whether access rights are still needed - if access rights are no longer needed, they shall be removed.

30.3.6 Users with administrative rights shall use multi-factor authentication [98] where this is technically possible.

30.3.7 Accounts with administrative rights shall only be used to perform defined administrative duties [99], and not be used for routine access to e-mail or the Internet. The administrative duty may include periodic access to emails/or internet to download software patches or perform a software update however, the risks of this open access should be controlled.

30.3.8 Where network access is under the control of the forensic unit (e.g. not a nationally delivered system), authentication failures should be throttled to 10 attempts in 5 minutes and locked out where this is practicable.[100] Access control

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98 Second factor authentication or two-factor authentication (often shortened to 2FA) is something that the user (and only the user) can access, such as a code that is sent by text message, or that is created by an application or dongle. [160]

99 With the exception of evidence handling software applications which require administrative rights for normal operation.

100 It is accepted that certain networks are outside of the forensic unit's influence and should be risk assessed appropriately. The clause is to protect the segregated forensic network for this type of attack.

mechanisms shall be protected to prevent unauthorised system-wide access. [46] [47]

The Selection, Use and Management of Passwords

30.3.9 The forensic unit shall have procedures for the selection, use, and management of passwords which should be formulated to help users to generate better passwords. The procedures shall include the following.

a. Passwords should be of an appropriate level of complexity. Consideration may be given to using:

i. the 'three random words' [48] technique for generating suitably complex and memorable passphrases; or

ii. machine generated passwords with appropriate facilities to store them such as password managers. [49]

b. Passwords shall be a minimum of 8 characters and should have no maximum length. Regular password expiry should not be enforced, but users shall change their password when it is known (or suspected) that it has been compromised.

c. Users should be directed to use different passwords for their:

i. personal and any work accounts; and

ii. general work account and any work accounts they may have with administrative rights.

d. Users should, where technically possible, be prevented from reusing passwords.

e. Users should, where technically possible, be directed to not select easily guessed or commonly used passwords [50] and should be prevented from doing so.

f. The system should be designed to protect the password in transit and at rest using appropriate encryption and hashing techniques. [47] [51] [52]

g. All default administrative passwords for applications, network equipment, and computers shall be changed [47] to meet the requirements identified in this section.

Protection Against Malware

30.3.10 The provisions of this section (comprised of 30.3.11 - 30.3.20) do not apply to evidence handling activities where the use of anti-malware processes have the potential to adversely affect the work. In activities where anti-malware processes are not employed the forensic unit should implement suitable safeguards against the effect of malware.

30.3.11 Subject to the provisions of section 30.3.10, the forensic unit shall have procedures for the detection, removal and/or treatment of malware. These procedures may be based on system design and one, or more, software packages. The procedures should ensure the detection, quarantine, removal and/or impact mitigation of malware. [101]

30.3.12 Software which is part of the anti-malware system shall be updated when new definitions become available. Anti-malware updates should be included in the forensic unit's change procedures to manage any potential impact to the forensic science activity.

30.3.13 Anti-malware system shall cover all compatible computers and hardware, unless specified operational requirements dictate otherwise. The forensic unit should implement additional anti-malware procedures such as application/executable allow listing. [53]

30.3.14 For all devices that access the internet, the forensic unit shall have (or ensure that its IT provider has) procedures in place to protect from website and email-borne malware caused by drive-by download and phishing attacks.

30.3.15 The forensic unit shall access the Internet via a proxy service which blocks malware. The forensic unit shall have procedures for filtering or blocking phishing emails or messages, before they reach users.

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[101] Whether software is anti-malware is not determined by the name of the package.

30.3.16 For all devices that access the internet, the forensic unit shall have procedures [102] to update (patch) malware software and firmware in a timely manner and included in the forensic unit's change procedures to manage any potential impact to the forensic examination process. 'Critical' and 'High' severity patches (as defined by the organisation issuing the patches) for Internet-enabled systems shall be installed promptly. Where this is not possible, then other mitigations (such as physical or logical separation) shall be applied.

30.3.17 Software and firmware that is no longer supported by vendors, should be replaced unless there is a technical or CJS justification for its continued use recorded in the procedure. [103]

30.3.18 All removable storage media, [104] including that believed to be new, shall be scanned using the anti-malware system before use/issue.

30.3.19 The forensic unit should securely configure computers by following the End User Device security principles. [53]

30.3.20 The forensic unit shall have access to backup data to assist recovery from malware. [54] [55]

Management of Removable Storage Media [105]

30.3.21 Procedures for management of removable storage media used by the forensic unit to transfer data (e.g. memory cards, USB drives, optical media) shall include controls related to issue and their use. These procedures shall include wiping/re-formatting of the storage media appropriate to the FSA the media is used in (i.e. typically using a defined secure or forensic method).

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102 Where this is a managed service, the forensic unit shall have access to the procedure for audit purposes.

103 For example, legacy software is sometimes required to access old media or for revisiting the analysis of old cases.

104 Optical media (e.g. CDs DVDs etc), digital tapes (e.g. mini DV, DVC Pro & Digi-8 etc) and analogue tapes (VHS, Hi-8 etc) are considered lower risk and a risk-based quality assurance rather than an absolute requirement to scan all these classes of media.

105 This procedure is for the general transfer of electronic information, it does not relate to item/exhibit and evidence handling.

30.3.22 Removable storage media shall only be issued to users whose role requires it. Only the minimum interfaces necessary for the use of removable storage media should be enabled on computers and those users to whom those computers are issued should be made aware of the permitted interfaces.

30.3.23 Personal removable storage media shall not be used for the transfer of electronic data - only officially issued removeable storage media shall be used which:

a. Shall be physically secured when not in use;

b. Should not be used to take data offsite unless its contents are secured using appropriate encryption techniques [56]; [106] and

c. Should be subject to accountability with the aim of tracking use and managing loss. [46] [57]

The Segregation of Forensic Networks

30.3.24 The forensic unit shall have procedures for the segregation of networks used for forensic science activities from other networks. Networks that do not need to communicate or interact with each other should be separated into different network segments, and only allow users to access a segment where needed. [107] Segregation can be achieved physically or 'logically'. Logical separation can include access control lists, network and computer virtualisation, firewalling, and network encryption such as Internet Protocol Security (IPSec). [58] [59]

Backups, Recovery and Business Continuity

30.3.25 The forensic unit shall have procedures for business continuity with an incident management plan including backup and retrieval of data, to recover from incidents such as malware (see 30.3.20), theft, fire, or hardware failure, whilst ensuring the business can continue to function.

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106 Storage media used for cameras and video surveillance are excluded from encryption.

107 Systems used for different forensic science work may need segregation from each other; for example, internet intelligence and investigation workstations and systems from other digital forensics activities.

30.3.26 The forensic unit shall identify what electronic data is essential to keeping operations running and make regular backup copies, or where that infrastructure is provided by the larger organisation (e.g. police force) seek assurance the backup is adequate.

30.3.27 The forensic unit shall identify its critical systems and have redundancy arrangements in place. The forensic unit shall test that backups are working to ensure it can restore the electronic information from them in the event of an incident. Offline backups shall be created and stored for as long as necessary to meet the requirements of the CJS.

30.3.28 Where digital data is the evidence, the procedure should be risk-based, balancing consideration of the time between creation of the extracted material, retention of the evidential device, and any identified off-site back-up requirement (see also 30.1.2 and 38 - Retention, Recording, Revelation and Disclosure).

30.3.29 Offline backups should be stored at a separate and secure location. [108] [60] [54] The forensic unit may use appropriate cloud services for this back-up of electronic information; 'offline' here means digitally disconnected or fully protected from any malware risk when not in use and/or designed and tested to remain unaffected should any incident impact the live environment through robust protection from malware. [61]

30.3.30 The forensic unit shall have an incident management plan [109] which helps staff identify, respond to, and recover from, incidents as well as continue to run the business. The incident management plan should include a communication strategy (which includes appropriate escalation levels to the SAI, the Regulator and, if accredited, its accreditation body), roles and responsibilities of staff and

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108 Ensuring the back-up is adequately protected from the same physical incident that may affect the primary data store such as fire, explosion or theft may be achieved by this being in a separate building not merely a separate room. However, the risk assessment may detail alternative mitigation to be included in, and tested with, the business continuity/incident management procedure. Sole traders may enter into reciprocal storage agreements if they choose to.

109 This may be part of the overall business continuity procedure or a separate IT incident management plan.

third parties such as service providers and authorities, as well as contact details for those involved.

30.3.31 The forensic unit shall test its business continuity procedure at least once in a four-year cycle (see 17.1.4). The incident management plan shall also be tested, whether it is part of the overall procedure or separate, to ensure that its electronic information and critical systems can be recovered in the event of an incident.

30.3.32 Revisions to the incident management plan should include lessons learnt to minimise the risk of disruption to the business occurring in the same way again. [46] [57] [61]

Network Security and Mobile Working[110]

30.3.33 The network security and mobile working procedures shall include the management of the network perimeter [111] by using firewalls to create a 'buffer zone' between the Internet (and other untrusted networks) and the networks used by the business.

30.3.34 The forensic unit shall have procedures to protect its internal networks by ensuring there is no direct routing between internal and external networks (especially the Internet). The forensic unit shall have procedures for securing wireless access to its networks. All wireless access points shall be secured using Wi-Fi Protected Access 2 (WPA2) or WPA3, and only allow known devices to connect to corporate Wi-Fi services.

30.3.35 Where mobile working is required, the forensic unit shall have procedures for ensuring that connections are identified, authenticated [112] and authorised. All electronic information which transits the Internet (and other untrusted networks)

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110 Mobile working includes home working.

111 A network perimeter is the secured boundary between the private and locally managed side of a network, often a company's intranet, and the public facing side of a network, often the Internet

112 The risk is loss of the item so multiple factor authentications should be considered where it is practical and technically possible.

shall be protected from eavesdropping and alteration using appropriate encryption such as IPSec and Transport Layer Security (TLS). [62] [51]

30.3.36 All mobile devices shall only have the necessary applications and electronic information to fulfil the business activity that is being delivered outside the normal office environment. If the mobile device supports it, data shall be encrypted at rest. The forensic unit should ensure there are adequate procedures for monitoring network traffic for unusual incoming and outgoing activity that could be indicative of an attack. The forensic unit shall have procedures for testing the security of its networks. [46]

The Use of Cloud-Based Services

30.3.37 The process for the use of cloud-based services shall include procedures to:

a. Determine the business need and end-user requirements;

b. Determine and document the boundary of the cloud and the network perimeter (i.e. is this an internal/private cloud); [113]

c. Identify what data will be transported, stored and processed, and document the associated risks;

d. Evaluate the security of the service offered; and

e. Understand the residual risks and how these will be managed.

30.3.38 The forensic unit should use cloud providers which meet the National Cyber Security Centre's cloud security principles. [63] The forensic unit should include within the contract with the cloud-based provider that storage and processing of evidential data using cloud-based services should only be performed from data centres physically located in the UK. The forensic unit should periodically review whether the cloud-based services still meet its business and security needs.

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[113] Internal cloud-based services may be entirely contained within the organisation's own network boundary and are therefore the applicability of all the requirements in all of section 31 should be considered and not simply clauses 30.3.37 a – e.

Security Monitoring and Situational Awareness

30.3.39 The forensic unit's security monitoring and situational awareness procedures shall include the generation, capture, retention, storage, and analysis of records from its computers and network equipment. The forensic unit's security monitoring procedures shall achieve the following.

a. Provide visibility of communication between their network and other networks (i.e. the Internet or 3rd party suppliers).

b. Capture authentication and access attempts.

c. Provide asset and configuration information. All records shall be stored securely so they are safe from tampering and unauthorised access. All records should be stored for a minimum of 6 months so that they can be used to support incident management. [64] [65]

31. Reference Collections and Databases

31.1.1 Forensic units shall maintain a list of all reference collections and databases (this includes, but is not limited to, those internally developed, commercially developed, or remotely accessed) used to:

a. make inferences and interpretation.

b. support the validation of search algorithms, training, and proficiency testing in house (i.e. Ground Truth Databases).

c. support the investigation or control of contamination (e.g. staff elimination databases and/or contamination elimination databases).

31.1.2 Forensic units shall have a process for determining the requirements of the CJS for internally developed reference collections and databases used to make inferences and interpretations or for supporting validation.

31.1.3 Information included in all reference collections and databases used to make inferences and interpretations should be capable of authentication through documentation to its original source, meet a minimum quality standard specified by the owner of the collection or database, be verified for accuracy of transcription on entry to the database, and be auditable for corruption.

31.1.4 Any programs or script for data manipulation employed within databases to make inferences and interpretations shall be validated, either separately or as part of the process or method they are used in as laid out in this Code, e.g. with reference to the impact of any uncertainty of measurement and the risk of false positives/negatives.

31.1.5 All reference collections and databases used to make inferences and interpretations shall be covered by documentation specifying, as a minimum:

a. Their purpose;

b. Their location and identification;

c. Their scope and content;

d. The origin of the data;

e. Any known significant limitations or restrictions;

f. The person responsible for management of the database;

g. The authorisation and competence requirements of organisations/practitioners contributing to the database;

h. The arrangements and format for data collection and submission;

i. The process for authentication or validation of the data appropriate for its use;

j. The arrangements and format for data storage;

k. The process for making updates and amendments, and maintaining audit trails;

l. The protocols for access to the database and its interrogation and use;

m. The quality assurance requirements, including those for data integrity, transfer, inconsistency, and error checking;

n. The confidentiality and security requirements;

o. The format and content of results and reports from interrogation of the database, including the provision of any caveats relating to any limitations with the results provided;

p. The projected shelf life of the data;

q. The arrangements for review of relevance, use and effectiveness; and

r. All relevant legal, commercial, and ethical requirements covering their registration, data content, retention, accessibility, or use.

31.1.6 Forensic units should collate the above information on existing as well as new reference collections and databases (used to make inferences and interpretations) and assess if any persisting gaps will affect critical findings and/or admissibility.

32. Equipment

32.1 Computers and Related Automated Equipment

32.1.1 The forensic unit shall ensure that any software used on computers or automated equipment is assessed for its impact on results and is documented in sufficient detail based on that assessment. This includes any software developed, configured, or modified by the forensic unit, or by other outside agencies working on the forensic unit's equipment.

32.1.2 Commercial off-the-shelf software and software tools whose operation has an impact in obtaining results will require validation, or any existing validation to be verified, as laid out in section 28.3 - Validation of Methods.

32.1.3 The forensic units' procedures shall include what testing or verification is required prior to computers and/or related equipment being returned to service e.g. when returning from calibration/maintenance or following a move.

32.1.4 Other commercial off-the-shelf software (e.g. Microsoft ® Word and Excel) that does not directly contribute to results obtained shall be considered suitably validated for general use. However, calculations embedded in spreadsheets that do not form part of a validated electronic process shall be included in the required systematic checks.

32.1.5 The forensic unit shall maintain records of software products installed on computer systems critical to the production of analytical results, and shall ensure configuration control so that only specified versions of software, settings,

and firmware, if applicable, are used. [114] The forensic unit shall have documented procedures for configuration management to ensure that all changes to software/hardware are controlled, and that all individual software installations are known and are periodically checked that the correct version is installed and no unauthorised modifications have occurred, e.g. by service engineers.

32.1.6 The forensic unit shall have a policy for all items/exhibits of equipment containing sensitive data to ensure the data:

a. Are secure during any maintenance visit;

b. Remain secure while off-site (e.g. for servicing); or

c. Have been removed or securely overwritten prior to removal from site or disposal.

33. Measurement Traceability - Intermediate Checks

33.1.1 Reference standards/materials and reagents shall not be used beyond the expiry date, where provided, unless it is verified that they remain fit for purpose beyond that date.

33.1.2 If photographic equipment is used for evidential purposes, then there should be traceable records related to the calibration/suitability of the equipment used.

34. Handling of Items/Exhibits

34.1 General

34.1.1 Any actions prior to the forensic staff attending the scene of incident or the forensic staff taking control of items/exhibits are outside of the control of the forensic staff. The forensic staff shall have processes to capture any observations about the scene or received items/exhibits that might have an impact on the examination or subsequent analysis.

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[114] Older versions of software may be needed for compatibility with work being undertaken related to older products, or to maintain the validated systems' configuration.

34.2 Items/Exhibits at the Scene of Incident

34.2.1 Before items/exhibits are recovered from the scene of incident, the practitioner shall consider the on-site conditions to ensure that the items/exhibits can be recovered and documented in line with the forensic strategy.

34.2.2 If doubts remain about whether the items/exhibits can be properly recovered in the prevailing circumstances, the commissioning party should be consulted (before proceeding) about whether and how the available resources should be used. For example, are additional 'specialist' examiners or technical resources required to conduct the examination or testing in situ.

34.2.3 The forensic unit shall ensure that its scene examiners are provided with and implement the relevant procedures to minimise the risk of cross-contamination between different scenes, items/exhibits, suspects, witnesses, and victims (see 27.2). [31]

34.2.4 The forensic unit shall have documented procedures to ensure that items/exhibits recovered from the scene are appropriately[115]:

a. Labelled;

b. Protected/packaged;

c. Preserved;

d. Listed on a schedule of recovered items;

e. Transported;

f. Stored;

g. Transferred for analysis/examination; and

h. Retained, returned or disposed of in compliance with documented procedures.

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115 Forensic units should provide suitable advice to exhibit officers to assist their understanding of their responsibilities in the control and management of exhibits after forensic units hand the exhibit over.

34.2.5 The forensic unit shall ensure that anti-contamination measures appropriate to the FSA, the analyte of interest, and the risk of contamination are employed for any vehicles and equipment used for scene examination purposes or the transport of items/exhibits and personnel.

34.2.6 Where a large quantity of potentially evidential material is available and sufficient representative sample needs to be taken for analysis/examination, including for presumptive testing, the practitioner should consider this in the sampling strategy.

34.2.7 The forensic unit shall protect the items/exhibits during processing and delivery to the intended destination, through handling, packaging, storage, and protection, and ensure that practitioners who may subsequently examine or analyse the items/exhibits are aware of anything that may have potentially compromised the items/exhibits integrity.

34.2.8 The forensic unit shall ensure that recovered items/exhibits are clearly and uniquely identified within the organisation rather than simply within the case. A combination of practitioner initials and identity number, plus date is not considered sufficiently discriminating. Although adoption of such a system would not devalue or invalidate the item if properly handled, it adds a risk which should be avoided.

34.2.9 Where applicable, the identity and location of the item/exhibit within the scene shall be documented or characterised as appropriate for example using plans, measurements, diagrams, photography and/or photogrammetry.

34.2.10 For this purpose, a ‘chain of custody’ record shall be maintained detailing the location of the item/exhibit at all times, from acquisition of items/exhibits which details each person who takes possession of the item/exhibit and when, or the location of the item/exhibit (e.g. if in storage). The chain of custody record shall include details of when the items/exhibits are destroyed or the circumstances under which they are released and to whom.

34.2.11 The forensic unit shall also ensure that the identification details provided with each item/exhibit, on the item/exhibit label, and accompanying submission form, remain with the item/exhibit throughout its life, so as to ensure that, using a

combination of the case number and/exhibit identification, no items/exhibits can be confused physically or when referred to in records or other documents.

34.2.12 All items/exhibits and associated documentation generated during scene examination shall be independently checked to ensure compliance with the requirements for acceptance set by the forensic unit. This should be at the appropriate stage to control the risk, typically prior to storage or submission for further examination/analysis to another forensic unit or section of the forensic unit.

34.3 Receipt of Cases and Items/Exhibits at the Forensic Unit

34.3.1 The forensic unit shall have procedures for the transportation, receipt [116], handling, protection, storage, retention, and/or disposal of items/exhibits.

34.3.2 These shall include a documented case acceptance policy which should include risk-based rejection procedure [117] for the handling of an item/exhibit for examination arising from, but not limited to:

a. Not being able to legally hold the material (e.g. not possessing necessary licences);

b. Having health and safety concerns about the submission or the ability to handle the material safely;

c. Not having the appropriate quality standards to do the examination requested;

d. A missing item/exhibit label;

e. A low level of agreement between the details on an item/exhibit label and those on the accompanying submission documentation;

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116 This should include procedures for checking and booking in items, that consider the risk of opening sealed containers without obtaining an immediate inventory i.e. particularly important for cases involving controlled substances/items, but relevant in any area where item/exhibit loss could be a consideration.

117 Whilst the non-FSA work of commissioning parties is outside the scope of this Code it is good practice for such parties to have procedures for receipt of cases and checking items/exhibits being returned from the forensic unit.

f. Inconsistency between the details on an item/exhibit label and/or accompanying submission documentation and what the item/exhibit actually is;

g. Illegibility in any information on an item/exhibit label;

h. There being conflicting information on the label(s) on an item/exhibit;

i. Appropriate control samples not being submitted;

j. Repeat of the same identification details on different item/exhibit labels;

k. Inadequate, improper, or untimely packaging or sealing of an item/exhibit that could prejudice its integrity;

l. Previous handling, storage, or evidence of tampering with an item/exhibit that could prejudice its integrity; and

m. Insufficient material being available for meaningful examination or analysis.

34.3.3 If the forensic unit is unable to accept the submission the reasons for rejection shall be recorded.

34.3.4 The process for reception of items should include identification of items which should be subject to additional safety and/or security provisions.

34.3.5 Any evidence of improper tampering with an item/exhibit or suggesting such tampering may have occurred or been attempted, shall be investigated (see 23.1.3). If the outcome of the investigation indicates a deliberate attempt has been made to affect the results of the examination, the SAI shall be informed to decide the appropriate escalation (which may include involvement of the police), which shall include notifying the Regulator.

34.3.6 The case acceptance procedure shall also specifically address the handling and receipt or rejection of potentially hazardous items/exhibits that might pose a risk to the health or safety of staff [118], potentially compromise other work carried out

[118] For example, when handling hypodermic syringe needles or blood samples.

at the forensic unit's facility [119], or which may not be lawfully retained or handled if accepted by the forensic unit [120] .

34.4 Item/Exhibit Handling, Protection and Storage

34.4.1 The forensic unit shall ensure that item/exhibit handling policies and procedures address continuity requirements including, but not limited to that:

a. The item/exhibit can, at all times when in the possession or control of the forensic unit, be uniquely identified so can be conclusively shown to be the item/exhibit submitted to the forensic unit;

b. Any specific measures that might apply due to the type of item should be identified i.e. alleged controlled substance, alleged firearm;

c. Any material recovered from or derived from an item/exhibit or sub-sample of an item/exhibit can be conclusively linked to the item/exhibit or sub-sample from which it came;

d. Any result can be conclusively linked back to the item/exhibit from which it came, or the key equipment used to create the result;

e. The forensic unit can show whether the item/exhibit was retained, returned to the organisation that submitted it, or destroyed;

f. The measures to secure items/exhibits and/or derived material to ensure that they cannot be tampered with or otherwise compromised without detection:

g. Only personnel authorised by management shall have access to the retained materials; and

h. Movement of material in and out of the facility shall be properly recorded (see 27.1 - Examination Facilities).

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[119] For example, firearms, bulk drugs seizures or explosives, where the forensic unit also carries out gunshot residue analysis or trace drugs or explosives analysis, unless separate reception arrangements and accommodation are provided for these.

[120] For example, cases involving human tissues, drugs, firearms or explosives, for which there may be specific health and safety legislation requirements or specific licensing required.

34.4.2 The forensic unit shall, as far as possible, store the item/exhibit in a manner which prevents deterioration. This shall include any temporary storage, such as in a vehicle at an incident scene, whilst awaiting transfer to a facility. Temporary storage facilities should also be assessed to ensure that the integrity and security of the item is not compromised.

34.4.3 The forensic unit shall, as far as possible, preserve the item/exhibit, or part of the item/exhibit, in its original form to allow for independent re-examination or testing. If an insufficient quantity of the item/exhibit remains for independent re-examination or testing, or the form of the item/exhibit is altered, the forensic unit shall ensure that details of the item/exhibit in its original form are recorded in sufficient detail for an independent examiner to be able to check that correct procedures and techniques have been used and that the results obtained appear valid.

34.5 Item/Exhibit Return and Disposal

34.5.1 The forensic unit shall have an agreement with its commissioning party for the return or disposal of items/exhibits once the examination has been completed. [121]

34.5.2 Forensic units may deal with material that is subject to legal control or prohibition on possession, production, or use. Policies covering such items/exhibits should reflect any legal control or prohibition covering retention, the return to the organisation that submitted the item/exhibits, or destruction. Examples of such items/exhibits include, but are not limited to:

a. Human tissue; [122]

b. Drugs;

c. Firearms; and

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121 Any specific clauses or controls stipulated shall be communicated to any subcontractors or external providers who are authorised to handle the items/exhibits.

122 See the Human Tissue Act 2004 [66].

d. Indecent images of children.

34.5.3 Human tissue is held by the police or a forensic unit as part of the CJS process it is, generally, outside the provisions of the Human Tissue Act 2004 [66] (see s39 of that Act). However, it is important that such tissue is managed appropriately, and the guidance issued by the Human Tissue Authority is of value in determining appropriate processes. When the tissue ceases to be required for CJS purposes it may become subject to the provisions of the Human Tissue Act 2004 [66]. The codes and guidance issues by the Authority should be considered when such situations arise.

34.5.4 If items/exhibits are to be returned to the commissioning party, or provided for use in court, the forensic unit shall ensure that the commissioning party or court is made aware of any potential health and safety issues relating to the item/exhibit, or its handling, and take appropriate steps to minimise the risk to the commissioning party or court.

34.5.5 If items/exhibits are deemed too hazardous to return to the commissioning party and there is no overriding need to retain, they shall be destroyed by the forensic unit in accordance with health and safety legislation, health and safety regulations and Home Office guidelines. [123] The requirements for retention, agreed with the commissioning party, shall also be adhered to.

35. Assuring the Quality of Results

35.1 Inter-Laboratory Comparisons (Proficiency Tests and Collaborative Exercises)

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123 See HOC 40/73: Handling and disposal of blood samples in criminal cases (other than those brought under the Road Traffic Act 1972) [144] this recommends to Chief Police Officers that on completion of examination the sample should be retained at the laboratory and the defence notified that it will be destroyed after 21 days unless they request otherwise. However, if the sample is exhibited, it should not be destroyed without the permission of the committing court. HOC 41/73 [145] provides similar recommendations to HOC 40/73 [144], but to the courts. HOC 125/76 [142] extends the arrangements of HOC 40/73 and 41/73 to the handling and disposal of saliva samples. HOC 74/82 [146]: Disposal of blood samples, saliva samples and swabs stained with body fluid: handling of items/exhibits: extends the arrangements of HOCs 40/73 41/73 and 125/76 to the disposal of swabs stained with body fluid. HOC 25/87 [143] extends the provisions of HOC 74/82 to cover the disposal of urine and any other body samples not previously covered.

35.1.1 The forensic unit shall review the availability and appropriateness of schemes for inter-laboratory [124] comparisons that are relevant to its FSAs and where relevant its scope of accreditation.[125] [126]

35.1.2 Annex C of ISO 17043:2010 [67] provides useful information to assist in selection or design of schemes whether the examinations or tests are quantitative, qualitative, or interpretive in nature and annex A of the Eurachem publication on proficiency test (PT) schemes [68] includes a checklist which includes consideration of the following.

a. Whether the parameters included in the scheme are similar to those of items/exhibits encountered in the everyday practice of the forensic unit.

b. Whether the strategies for data collection and analysis applied by the PT provider are suitable for the needs of the forensic unit.

c. Whether the method used for assessing the participants' performance is clearly described by the PT provider and understood by the forensic unit.

d. The competence of a PT provider, for example:

i. Compliance with the requirements of ISO 17043:2010 [67], e.g. accreditation; [127]

ii. Track record in delivering such schemes;

iii. Reliability of the assigned values; and

iv. Fitness for purpose of criteria for proficiency assessment.

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124 An inter-laboratory comparison is a widely recognised generic term for an exercise carried out between group of organisations conducing comparable testing activities; laboratory here means the organisation, in this Code it should be read as forensic unit.

125 ISO 17025 [1] requires only suitable externally provided products and services that affect testing activities to be used. This includes proficiency testing services. ISO 17043:2010 [67] contains recommendations and guidance on the requirements for the operation of PT schemes. These documents should be used as a basis for such an evaluation.

126 UKAS accredits PT providers to ISO 17043:2010; a list of accredited schemes/providers is available. [69]

127 UKAS recommends the use of an accredited scheme where one exists. [161]

35.1.3 The forensic unit shall participate in appropriate schemes, in order to monitor the validity of its examinations or tests, and its performance, both against its own requirements and against the performance of peer forensic units. [69] [128]

35.1.4 When participating in inter-laboratory comparison schemes, the forensic unit's own documented methods and procedures shall be used.

35.1.5 Proficiency testing records should include [3]:

a. Full details of the examinations/tests undertaken;

b. Results and conclusions obtained;

c. An indication that performance has been reviewed; and

d. Details of the corrective action undertaken, where necessary.

35.1.6 Unexpected performance in proficiency tests or inter-laboratory comparisons shall be handled as non-conforming testing (23.1 - Control of Non-Conforming Examination and Testing).

36. Reporting the Results

36.1 General [21]

36.1.1 The forensic unit shall detail in a procedure roles and responsibilities to ensure the appropriate exchange of information and authorisations. This should cover communication of reports (including evaluative reports) with the commissioning party (and as needed other parties in the CJS), as appropriate, within agreed timescales in accordance with the requirements and needs of each specific case and the known key dates in the criminal justice process.

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128 Forensic units may refer to the European Proficiency Testing Information System [163] or the European Network of Forensic Science Institutes (ENFSI) [141] websites for the availability of proficiency testing (PT) schemes. The appropriateness of such schemes will still need assessing, and the assessment recording.

36.1.2 The forensic unit shall provide early warning of any operational or scientific issues that could affect the timeliness (i.e. substantial delay) of service delivery to the commissioning party. [129]

36.1.3 The practitioner shall be competent and comply with all relevant sections of the Criminal Procedure Rules [35] and Criminal Practice Directions [27]. Where evidence including opinion is provided the practitioner shall comply with the requirements for evidence of opinion [70] and the applicable obligations on expert witnesses. [21] Reports shall comply with applicable legal provisions.

36.1.4 Full records shall be kept of work done and the results obtained in line with other retention policies, even if the commissioning party does not require a detailed report. [130]

36.1.5 The forensic unit shall consider and record whether any activity by the Regulator, as described above, creates an obligation to disclose in reports issued by the forensic unit or its practitioners.

Duty to Court

36.1.6 Expert witnesses act as independent advisors to the court and this role creates obligations, to the court, which override any duty to the commissioning party (or anyone else). [21]

36.1.7 Persons acting as an expert witness shall not do anything which is contrary to their obligations to the court or fail to do something which is required by that duty.

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129 See Criminal Procedure Rules [35] 19.2(1)(b)(ii) where warning the court of any significant failure to act as required by a direction includes warning of any substantial delay in the preparation of a report.

130 Documentation of work underpinning reports and statements may be kept separate where it is traceable to the correct reports and statements.

Declarations of Compliance and Non-Compliance with Required Standards [131] [70] [71]

General

36.1.8 All practitioners shall disclose in reports of findings from an FSA their compliance, or non-compliance, with this Code. [132]

36.1.9 This Code incorporates the FSA definitions (see F3 - FSAs – Definitions subject to this Code) so a practitioner will be compliant with this Code only if they also comply with requirements set out in the relevant FSA definition (e.g. accreditation to ISO 17025 [1] and adherence to this Code or to an appendix to this Code). [133]

36.1.10 All practitioners shall declare/disclose compliance with this Code in reports intended for use as evidence (other than as evidence of agreed fact) in the following terms, or in terms substantially the same:

a. ‘I confirm that, to the best of my knowledge and belief, I have acted in accordance with the Code of Practice published by the Forensic Science Regulator [insert issue]’; or

b. ‘I have not complied with the Code of Practice published by the Forensic Science Regulator [insert issue]. The details of this non-compliance are included to the best of my knowledge and belief in Annex [x], with details of the steps taken to mitigate the risks associated with non-compliance.’

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131 Non-compliance is considered to be information that could significantly detract from the credibility of a witness and may have a bearing on reliability. In England and Wales, disclosure of such matters is not restricted to experts (see the Criminal Procedure and Investigations Act 1996 [129], R v. Ward [1993] 1 W.L.R. 619 [156] and Kumar v. General Medical Council [2012] EWHC 2688 (Admin) [154], or to the prosecution (see Criminal Practice Directions [27] V 19B (1) 13 and Criminal Procedure Rules [35] 19.3(3)(c)).

132 See Criminal Practice Directions [27] V 19B (1) 13 “I confirm that I have acted in accordance with the code of practice or conduct for experts of my discipline, namely [identify the code]”.

133 If the set requirement is accreditation to ISO 17025 [1] and this Code, but the practitioner’s forensic unit only holds accreditation to ISO 17025 [1] without including this Code then it is not fully compliant and the practitioner must disclose this.

36.1.11 Where, in compliance with the provisions of section 36.1.10, a practitioner describes the steps taken to mitigate a non-compliance with this Code that description shall, in particular, address the following issues.

a. The competence of the practitioners involved in the work.

b. The validity of the method employed.

c. The documentation of the method employed.

d. The suitability of the equipment employed (including the approach to maintenance and calibration).

e. The suitability of the environment in which the work is undertaken.

36.1.12 The Regulator may issue guidance on making declarations.

Declarations and Changes to Accreditation Status

36.1.13 Forensic units shall promptly and as soon as practicably possible report to the Regulator any suspension, withdrawal, or change in their accreditation status (and/or the accreditation status of any organisations providing external forensic services), where the suspension, withdrawal, or change in accreditation means that the forensic unit is no longer compliant with the Code as set out in the accreditation that previously applied to the FSAs or work undertaken by the forensic unit.

36.1.14 If such a situation arises, the forensic unit should take the following steps.

a. The forensic unit shall inform the investigation and prosecution authorities identifying all cases affected by the change in accreditation status, making specific reference to Section 4 of the Act [10] and noting that any statements or reports that are affected are no longer compliant with the Code.

b. The forensic unit should set out in their report to the Regulator:

i. the basis and reasons for the suspension, withdrawal or change in accreditation;

ii. any action that has been taken to deal with issues that have led to suspension, withdrawal or change in accreditation; and

iii. the impact of any suspension, withdrawal or change in accreditation on the results or opinions that have been made in any statements or reports.

c. The forensic unit shall use appropriate and risk-based strategies to consider where amendments to witness reports are required as a result of changes to accreditation status or compliance with the Code. The Regulator may advise the forensic unit in determining what amendments to reports are appropriate.

36.1.15 The Regulator may publish a notice on the Regulator's website setting out the detail of the suspension, withdrawal or change in accreditation and the impact based on the above.

36.2 Types of Report in the CJS

36.2.1 Forensic units, or practitioners working in forensic units, may be required to supply reports to support the judicial process which is covered by the requirements in this Code including the provision of the following.

a. Interim progress reports [134] to support criminal investigations. These are initial forensic reports used to inform an enquiry, interview, or strategy. This report is not intended for use as evidence but may be disclosable as unused material and does not require a statement of compliance with this Code (see 36.1.8 et seq - Declarations of Compliance and Non-Compliance with Required Standards).

b. Streamlined Forensic Reports (SFR) [72]. These have been introduced for certain evidence types for use in the case management process to establish the level of agreement between the defence and the prosecution.

i. The SFR1 is a summary of the evidence served to determine whether there is any agreement of the evidence, or to ascertain whether there are any issues in dispute. It is deliberately not presented in an admissible format as it is not intended to be

[134] ILAC G19 [3] section 4.9 includes oral reports, including the requirement to record the information conveyed.

presented at trial other than as agreed fact and it does not need to comply with provisions with regard to reports contained in the Criminal Procedure Rules 19.4 [35] or Criminal Practice Directions V 19B [27]. It does however require a statement of compliance with this Code for FSAs subject to this Code, and a statement of whether the results are from a method which requires accreditation and if so, if the method is within the forensic unit's schedule of accreditation. [135] [136]

ii. The SFR2 is produced to answer the issue(s) raised by the defence in response to the SFR1, it is intended to be presented in evidence, unless a full evaluative report is required instead. Therefore, an SFR2 does require a statement of compliance with this Code for FSAs subject to this Code, and if it is providing evidence of opinion it requires an expert's declaration under Criminal Procedure Rules 19.4 [35].

c. Reports (a statement is a type of report) for use in court proceedings.

i. Factual reports require a statement of compliance with this Code.

ii. Expert reports including opinion evidence require a declaration under Criminal Procedure Rules 19.4(j) [35]and 19B of the Criminal Practice Directions V [27] which should include a statement of compliance with this Code as part of the declaration required by 19B of the Criminal Practice Directions V [27].

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135 The Crown Prosecution Service (CPS) has stated that, in England and Wales, "Statements and Streamlined Forensic Reports (SFR1 and SFR2) should state whether the organisation or laboratory concerned is accredited, whether the forensic evidence relates to DNA and fingerprint evidence or other forensic disciplines." This position is to facilitate the policy described in the CPS Internet section on evidence of opinion. [157]

136 In cases where those preparing the SFR1 are aware of further information that might meet the test for common-law disclosure set out above, that information should be communicated to the investigator and by the investigator to the prosecutor using form MG6 (or its equivalent).

iii. The court may extend a number of the requirements applicable to evidence of opinion to expert evidence of fact (See Part 19 Criminal Procedure Rules [35]).

d. Certificates (e.g. issued under provisions of the Road Traffic Offenders Act 1988 [73]).

i. The content of a certificate must comply with the provisions of the statute which created the right to use the certificate. Unless the statute prohibits it, a certificate should include a statement of compliance with this Code.

36.3 Opinions and Interpretations

General

36.3.1 Where opinions and interpretation are to be included in a forensic unit's schedule of accreditation, the forensic unit will need to ensure that it is acting in compliance with the UKAS publication LAB 13 [74] and ILAC-G19 [3] section 4.9. If the forensic unit is accredited by an accreditation body other than UKAS, it shall be in compliance with ILAC-G19 [3] and the requirements of that body in relation for opinions and interpretation.

Evaluative Opinions

36.3.2 A forensic unit providing evaluative opinion evidence shall meet the following requirements.

a. The policies and procedure for case assessment and interpretation shall be part of the quality management system.

b. The policies and procedures for making reports of evaluative opinion shall be part of the quality management system. [137]

c. The method for evaluation shall be validated according to this Code.

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[137] This is a requirement of LAB 13 section 6.4. [74]

d. The policies and procedures shall require there is clarity in any report as to the source(s) of data used in forming the evaluative opinion. [138] [139]

e. Experts providing evaluative opinion shall be demonstrably competent to do so (see also 26.3.7).[140]

f. Any statistical models and assumptions involved in the evaluation shall be clear to the CJS and shall be valid.[141] [142]

g. Processes for the peer review of evaluation shall be part of the quality management system. [143]

37. Secondary Case Review

37.1 Scope

37.1.1 This section of this Code applies to situations where the work of a forensic unit (the initial unit) is reviewed by a different forensic unit. This covers, but is not limited to, the following situations.

a. A review commissioned by the same party that commissioned the initial work (e.g. a cold case review).

b. A review commissioned by another party to the case (e.g. a defence examination).

c. A review commissioned by a body with legal authority to do so (e.g. the Criminal Cases Review Commission or a public enquiry).

d. A review commissioned by the Regulator.

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138 This is a requirement of LAB 13 section 6.21. [74]

139 This is a requirement of Part 19 CrimPR. [35]

140 This is a requirement of LAB 13 sections 6.6, 6.13 and 6.14 [74]. It is also a requirement of ILAC G19 4.8.3. [3]

141 This is a requirement of LAB13 section 6.10. [74]

142 The validity of the model employed should be addressed as part of the validation of the method (see Methods and Method Validation 28.3.19 and 28.3.70.

143 This is a requirement of ILAC G19 section 4.8.2. [3]

37.1.2 There may be a number of secondary reviews in any case and these may be concurrent or sequential.

37.2 General

37.2.1 The initial forensic unit shall only assist with a case review of that work if it is:

a. Instructed to do so by the party which commissioned the work; and/or

b. Provided with legal authority requiring it to assist.

37.2.2 A forensic unit instructed, or required, to assist in a case review shall have defined policies and procedures to facilitate access by the forensic unit undertaking the review to the extent authorised or required.

37.2.3 The policies and procedures shall ensure the security and integrity of the items/exhibits and records requested for review, but must also ensure the confidentiality of other work in progress or previously undertaken by the forensic unit where that does not fall within the scope of the case review.

37.2.4 A forensic unit commissioned to perform a case review shall ensure that any additional tests or examinations are conducted in accordance with the requirements set out in this Code, or any deviations recorded and declared.

37.2.5 Where a forensic unit is commissioned, by a party other than the prosecution, to review work of a forensic unit commissioned by the prosecution it shall:

a. Comply with any conditions attached by the prosecutor to the release of the items/exhibits, or parts of items/exhibits; or

b. Act within the scope of authority of its commissioning party if that party has legal authority to act beyond the approval of the prosecutor.

37.2.6 The forensic unit commissioned to perform the case review shall retain the notes and records it has created in line with this Code.

37.3 Defence Examinations [144]

144 The content of this section reflected the Crown Prosecution Service position with regard to control of items/exhibits.

37.3.1 A forensic unit commissioned by the defence seeking access to any items/exhibits, records, or equipment etc shall first obtain approval for access to these from the prosecutor (or if a prosecuting authority is not involved at that stage from a person with authority over the material).

37.3.2 The forensic unit commissioned by the prosecution shall make available to the forensic unit commissioned by the defence only what has been deemed by the prosecutor or court to be relevant. Copies of such case file records, documents, and supporting information etc. that have been reasonably requested by the forensic unit commissioned by the defence and been deemed relevant may then be provided in hard copy or secure electronic form [145] and be taken into their possession for examination away from the premises of the forensic unit commissioned by the prosecution.

37.3.3 The forensic unit commissioned by the defence shall retain the notes and records it has created in line with this Code. Material supplied by the forensic unit commissioned by the prosecution shall only be used for the specific case(s) for which the material was provided. [146]

37.3.4 Material supplied by the initial forensic unit is subject to the Data Protection Act 2018 [75] and may be subject to Police and Criminal Evidence Act 1984 [76] as amended by the Protection of Freedoms Act 2012 (e.g. fingerprints and DNA) [77]. [147]

37.3.5 The forensic unit commissioned by the prosecution shall only release items/exhibits (or evidential material recovered from them) to the defence for examination or testing away from the premises of the forensic unit

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145 The Legal Aid Agency's position on charges levied upon the defence by prosecution forensic science laboratories is available in their publication 'Guidance on forensic science laboratory charges in criminal matters'. [162]

146 The forensic unit commissioned by the prosecution may require, if it chooses to, that supporting supplementary material (e.g. manuals, SOPs) is returned by the defence's forensic unit or that the supplied copies are destroyed, as appropriate, once the case is concluded.

147 The Protection of Freedoms Act 2012 [77] modified the Police and Criminal Evidence Act 1984 [76] to have specific controls for the destruction, retention and use of biometric data which means certain requirements may be stipulated as a condition of access to any third party which is authorised to handle material.

commissioned by the prosecution on receipt of written instructions from the prosecutor and/or the court. Where the examinations or testing might affect the condition of the items/exhibits, the forensic unit commissioned by the prosecution shall ensure that the prosecutor and/or the court is made aware of this before the items/exhibits are released and that this is recorded.

37.3.6 The forensic unit commissioned by the prosecution shall ensure that all examinations and tests carried out on its premises by the forensic unit commissioned by the defence are adequately supervised, to ensure that they are carried out in accordance with the instructions given by the prosecutor and that nothing is altered, damaged, or destroyed without the prior permission of the prosecutor.

37.3.7 The forensic unit commissioned by the prosecution shall ensure that all items/exhibits (or parts of items/exhibits, or evidential material recovered from them) that are to be released to the defence are recorded, securely packaged, labelled, and any conditions that apply to handling and retention are recorded in writing (e.g. from the court, prosecution, commissioning party). The forensic unit commissioned by the prosecution shall also retain a record, signed by a person acting on behalf of the receiving party, of the transfers for continuity purposes.

37.3.8 The forensic unit commissioned by the prosecution shall check the integrity and continuity records of the returned items/exhibits, or parts of items/exhibits, or records for compliance with any conditions of release. Any deficiency in these respects upon return shall be communicated promptly to the prosecutor and the commissioning party, e.g. the police.

38. Retention, Recording, Revelation and Disclosure

38.1.1 All practitioners and forensic units shall comply with legal obligations on retention of evidence, revelation to the commissioning party, and disclosure. [21] [22] [77]

38.1.2 The forensic unit shall have a retention policy which ensures that retention of records pertinent to the FSA are maintained for at least the minimum period to fulfil the legal obligations on retention of evidence. The retention policy should include consideration of the following.

a. The retention period [148] for records that that satisfy the requirements of legislation, its accrediting body, the party commissioning the work [22], and this Code. The retention of records policy shall consider the following.

i. Full records shall be kept of work done and the results obtained in line with other retention policies, even if the commissioning party does not require a detailed report (including any statement).

ii. Obsolete/superseded documents, taking into account commissioning party [22], regulatory, and legal requirements (see section 20).

iii. Non-conformities or complaints and the subsequent reviews and outcomes in line with the case file retention period.

iv. For the period of record retention, traceability shall be maintained for all names, initials, and/or identifiers. These should be legible and understandable.

v. Training manuals, training and competence assessment records in line with the policy for retention of case files.

38.1.3 The retention policy shall ensure the retention, return, or destruction items/exhibits (see 34.5 – Item/Exhibit Return and Disposal) meets the legal obligations placed on the forensic unit or assists, or at least does not interfere with, obligations placed on the commissioning party.

38.1.4 Forensic units can be the commissioning body, with external forensic units acting as sub-contractors or external service providers. The retention requirements for items/exhibits and any copies of items/exhibits should be set out in any contractual agreements between the commissioning body and forensic unit being commissioned (see section 22).

38.1.5 Original items/exhibits collected or seized by, or submitted to, forensic units should be returned to the commissioning body, normally as soon as possible after the FSA is complete and/or the case is reported, except where:

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148 See the NPCC Guidance for Retention, Storage and Destruction of Materials and Records relating to Forensic Examination [22]

a. They fall within the special provisions, such as being a biohazard, or have other controls stipulated by the commissioning body;

b. They are/were submitted to NaBIS; and/or

c. Agreement is reached for the forensic unit to retain them, or part of them, under specialised storage conditions, for an agreed and lawful purpose.

38.1.6 The Criminal Procedure Rules place requirements on all parties who want to introduce evidence of opinion to assist with access to the records of examinations, measurements, tests, or experiments which were used to generate the opinions expressed by the expert. However, it is not a general right for access to all information the forensic unit is required to retain. [149]

38.1.7 Forensic units commissioned by the prosecution must support the disclosure process and provide access to the defence to material identified as relevant by the prosecution. [26]

38.1.8 All documents, items/exhibits and evidential material recovered from items/exhibits that are retained by forensic units shall be archived in secure storage, in conditions to prevent damage or deterioration, and indexed so as to facilitate orderly storage and retrieval. [150]

38.1.9 Only personnel authorised by management shall have access to the retained materials. Movement of material in and out of the archives shall be recorded.

39. Demonstration of Compliance

39.1 General

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149 Under Rule 19.3(3)(c), anything which the party serving the report it is aware of which might reasonably be thought capable of undermining the reliability of the expert's opinion shall be disclosed, this includes the lack of an accreditation or any other commitment to prescribed standards where that might be expected (see CrimPD V 19A.7). However, under Rule 19.3(3)(d), the Standard Operating Procedure for the FSA is not a record of any examination, measurement, test or experiment on which the expert's findings and opinion are based. Such documents may be disclosed, but there is no automatic right, and access in other cases does not establish such a right.

150 The cost of archiving documents relating to the forensic unit's testing and examinations is a business cost to be borne by the forensic unit. Reimbursement of the costs for archiving items/exhibits and evidential material recovered from items/exhibits is a business matter to be agreed between the forensic unit commissioned by the prosecution and the commissioning party (e.g. police).

39.1.1 The Regulator requires, for certain FSAs, that forensic units shall demonstrate compliance with this Code in a particular manner.

39.1.2 Where the Regulator has established such a requirement it is set out in section 9 and in the appendix relevant to the FSA.

39.2 Accreditation

General

39.2.1 For any FSA the Regulator may require a forensic unit undertaking the FSA to achieve and maintain any combination of the following.

a. Accreditation to an appropriate international standard. [151]

b. The accreditation includes adherence to the requirements of this Code.

39.2.2 All forensic units undertaking an FSA which is subject to this Code are bound by this Code (which may include, or be restricted to, one, or more, of the appendices) to the extent set out in the appendices. The method of demonstrating compliance with this Code is through accreditation to ISO 17025 [1], ISO 17020 [2] and/or ISO 15189 [18] with adherence to this Code recorded in the schedule of accreditation. There may be exceptions to this requirement, and they will be set out in the appendices.

39.2.3 The appropriate international standard, or standards, for FSAs subject to an accreditation requirement is provided at section 9 and in the relevant appendices.

39.2.4 The requirement for accreditation may incorporate the application of documents the Regulator considers to be relevant (e.g. UKAS LAB 13 [74]). Such documents will be listed in section 11.2 - Normative References.

39.2.5 Accreditation to an international standard will only be considered to have met the requirement if:

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151 A standard published by the International Organization for Standardization.

a. The schedule of accreditation covers those sub-activities of the FSA defined as being required to be within the accreditation scope (subject to the provisions with regard to infrequently used methods); and

b. The forensic unit has signed a waiver of confidentiality to allow the accreditation body to share information with the Regulator.

New Methods

39.2.6 It is recognised a new method may require a period of time from introduction to obtain suitable data to demonstrate the operation of the process or procedure satisfactorily for an accreditation body to include this method within the forensic unit's schedule of accreditation. Forensic units intending to introduce such methods should consider the applicability of the provisions around infrequently used methods set out in section 28.3.50 et seq and/or discuss options with the accreditation body. [152]

Infrequently Used Methods

39.2.7 Where this Code establishes, for an FSA, a requirement for accreditation to an international standard the forensic unit shall achieve and maintain such accreditation.

39.2.8 The schedule of accreditation shall cover the FSA, but it is not required to cover methods which are infrequently used methods within the provisions of section 28.3.50 et seq.

39.2.9 Nothing in sections 39.2.7 and 39.2.8 should be taken as overriding the provisions of The Accreditation of Forensic Service Provider Regulations 2018 [16].

Exigent Circumstances

39.2.10 Where accreditation is required, and exigent circumstances mean that a method other than that as detailed in the schedule of accreditation needs to be used

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[152] Certain parallel or duplication of processing may be used within the same organisation to satisfy this requirement, provided splitting casework does not render the sample suboptimal or introduce significant limitations.

and there is no legal impediment, [153] this should be made clear to the commissioning party and the fact that accreditation should apply and was not held should be declared in any reports. Section 36.1.8 et seq 'Declarations of Compliance and Non-Compliance with Required Standards' details some options for declarations. The expectation is that, where any required standard is not met fully, in addition to the declaration a separate annex [154] to the report is also produced which details how the risk is mitigated.

Accreditation Bodies

General

39.2.11 Any requirement for accreditation will only be achieved if the accreditation is issued by an accreditation body recognised by the Regulator.

39.2.12 An accreditation body will only be recognised by the Regulator if the following conditions are met.

a. The body is recognised as an accreditation body by the Government of the country/territory in which it operates.

b. It provides, or is seeking to provide, accreditation in a country/territory where it is legally appointed to do so.

c. It will only accredit forensic units against this Code where the unit has signed a confidentiality waiver as required by section 39.2.5.

d. It incorporates this Code in the schedule of accreditation.

e. The requirements of ILAC G19 [3] are incorporated into the accreditation process.

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153 See also The Accreditation of Forensic Service Providers Regulations 2018 [16], The Accreditation of Forensic Service Providers (Amendment) Regulations 2019 [147] and European Union (Future Relationship) Act 2020 [148].

154 Producing an annex dealing with issues arising from partial or non-compliance allows the complex issue to be dealt with in the statement/report and could allow forensic units to produce standard lines to take for certain methods. Further detail on the content of the annex is available in the Regulator's publications on reports and statements. [70]

f. It has entered, and operates in accordance with, a data sharing agreement with the Regulator which addresses the issues in section 39.2.16.

39.2.13 The Regulator recognises that the Department for Business Energy and Industrial Strategy take a position on behalf of Government that there will be a single National Accreditation Body for the UK, and that UKAS is appointed as the sole UK National Accreditation Body by the Accreditation Regulations 2009 (S.I. No 2009/3155) [78] and Schedule 33 of the Product Safety and Metrology etc. (Amendment etc.) (EU Exit) Regulations 2019 (S.I. 2019/696) [79].

39.2.14 The conformity assessment and accreditation policy in the UK from the Department for Business Energy and Industrial Strategy requires UK conformity assessment bodies seeking accreditation to do so from UKAS as the sole National Accreditation Body for the UK.

39.2.15 UKAS is a non-profit-distributing private company, limited by guarantee. It operates as an independent body providing a public authority activity and operating in the public interest.

Data Sharing

39.2.16 The data sharing agreement mentioned in section 39.2.12 must achieve the following.

a. The accreditation body must be able to share any concerns or information about a forensic unit with the Regulator.

b. The Regulator must be able to share any concerns or information about a forensic unit with the accreditation body.

c. The accreditation body must be able to provide the Regulator with any information about the number of bodies accredited.

39.2.17 The Regulator may share information related to any quality concerns about a forensic unit with the appropriate accreditation body or accreditation bodies.

UKAS

39.2.18 UKAS will, at least in non-scene based FSAs, where this Code requires accreditation, assess forensic units undertaking FSAs against ISO 17025 [1] or

ISO 15189 [18] [155] utilising any of the relevant UKAS laboratory publications [80], ILAC-G19 [3] and the supplementary requirements of this Code, and will, if the forensic unit has achieved the requisite standards, include compliance with this Code in the Schedule of Accreditation. [156] UKAS can assess forensic units providing FSAs at scenes of incidents [157] against ISO 17020 [2], ISO 17025 [1], ILAC-G19 [3], ILAC-P15 [81], this Code, and the inspection recommendation and guidance publication UKAS-RG 201 [17].

Accreditation Issues

39.2.19 The Regulator has based the accreditation requirements in this Code on the use of the international standards ISO 17020 [2] and ISO 17025 [1].

39.2.20 Accreditation to ISO 15189 [18] is a suitable alternative to ISO 17025 [1] for undertaking certain FSA, provided that 'Forensic Testing/Analysis' is clearly indicated in the scope of accreditation; this means that the forensic unit has been assessed in accordance with ISO 15189 [18] taking into account ILAC-G19 [3]. The FSA for which accreditation to ISO 15189 [18] is appropriate are set out in the FSA definitions.

39.2.21 Other standards used for certification of organisations that provide scientific services – e.g. Good Laboratory Practice regulations [82] and Good Manufacturing Practice [83] are not alternatives to ISO 17020 [2], ISO 17025 [1] or ISO 15189 [18], although they do overlap to some extent and provide compatible guidance on good practice.

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155 Where accreditation is the requirement in the definition of the Forensic Science Activity.

156 The Regulator has a Memorandum of Understanding with the national accreditation body UKAS, agreements with other national accreditation bodies may be entered into if required.

157 The term 'scenes of incident', includes scenes prior to establishing whether a criminal or illegal action has taken place and relevant locations, for example where a body is found.

Part F – Appendices

F1 - Infrequently Commissioned Experts

40. Infrequently Commissioned Experts

40.1 Scope

40.1.1 It is recognised that experts from outside the forensic science profession will be called to give evidence, in relation to an FSA, from time to time. This could include technologists and material scientists from manufacturing industry (e.g. glass, textiles, building materials). These shall be referred to as Infrequently Commissioned Experts (ICE). Where ICE provide advice/evidence in relation to an FSA which is subject to this Code it is impractical to require (a) compliance with all provisions of this Code or (b) compliance with the means of demonstrating compliance (e.g. accreditation).

40.1.2 An individual shall only fall within the definition of an ICE if the conditions in section 40.1.3 are met in relation to both the practitioner and the evidence provided.

40.1.3 The practitioner, subject to the provisions of section 40.1.4, shall:

a. Not be a member of staff of a forensic unit providing services to the CJS in England and Wales;

b. Not represent themselves as a forensic scientist operating within the CJS in England and Wales; and

c. Not have been involved, in an advisory or expert capacity, in any case in the CJS in England and Wales in the previous 12 months.

40.1.4 Provision of evidence to a different justice system (e.g. Family Justice System) is not deemed to contribute to the frequency with which a person has any involvement in the CJS and so does not have bearing on the status of ICE.

40.1.5 The evidence provided by an ICE shall not be of a type which can routinely be obtained from a forensic unit.

40.2 Requirements

40.2.1 ICE shall comply with the following requirements.

a. The general obligations of expert witnesses [21] including the requirements of the CJS as contained in the Criminal Procedure Rules [84] (and Criminal Practice Directions V, in particular 19A.5 and 19B [27]).

b. The requirements for contents of reports [158], including but not limited to, those prescribed in the Criminal Procedure Rules 19.4 [35] and Criminal Practice Directions V 19B [27].

c. Retention, recording, revelation and disclosure obligations.

d. The requirements pertaining to the use of reference collections and databases should they rely on them.

e. The requirement to use validated methods or procedures based on sound scientific principles and methodology.

f. The need to demonstrate competence in using these methods or procedures, and evaluating the results obtained objectively and impartially, and according to established scientific and statistical methodology.

g. The need to consider the impact that confirmation/cognitive bias can have at different stages and use appropriate avoidance strategies.

h. The declaration required in the Criminal Practice Directions V 19B [27] and the Regulator's requirement for the positive declaration to be in the following terms: [159]

> "I confirm that, to the best of my knowledge and belief, I have acted in accordance with the Code of Practice published by the Forensic Science Regulator [insert issue] as it pertains to experts from other professions. Annex [x] details the steps taken to comply with the specific requirements set for experts from other professions."

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158 A statement is one form of a report. It is formatted to comply with the provisions of s9 Criminal Justice Act 1967 [138].

159 Experts will need to produce a different declaration if there are other non-compliances, whether inability to comply with specific clauses in the Standards of Conduct, or that accreditation is required.

F2 - FSA Definitions – General Provisions

41. Purpose

41.1.1 To avoid considerable repetition in the definitions of FSAs, in the FSA specific appendices, this section addresses conditions and provisions which apply generally.

41.1.2 The definition of FSAs are mutually exclusive in that each FSA is a definition of a discrete forensic science activity, there is no overlap or duplication in the FSA definitions.

41.2 The Regulator's Interpretation of the Standards and Required Compliance

41.2.1 ISO 17020 [2] is a standard for inspection activity and applies to incident scenes because there is a need to take a holistic view to interpreting and examining the incident scene. ISO 17020 [2] is most appropriate where the forensic unit reviews the incident scene and formulates a strategy to interpret the events at the incident scene and identify the significance of material for subsequent recovery and/or testing; some of this testing could in some circumstances be conducted at the scene, for example, presumptive testing for blood. This at scene testing could be conducted by the forensic unit who hold accreditation to ISO 17020 [2] or the forensic unit holding ISO 17020 [2] could request another forensic unit to conduct this testing under ISO 17025 [1].

41.2.2 ISO 17025 [1] is a standard for testing activity and applies to material that is examined in controlled conditions. The practitioner undertaking the test needs to understand the context of the criminal investigation but only addresses specific aspects.

41.2.3 Where a forensic unit holds ISO 17025 [1] accreditation for an FSA in a dedicated facility, the unit could extend the scope of its ISO 17025 [1] accreditation to include testing at scenes, and/or at a location away from the dedicated facility (for example a police station on items that have been identified in advance). Once granted, this extension to scope would be included within the forensic unit's ISO 17025 [1] schedule of accreditation.

41.2.4 Where an FSA definition requires accreditation to an ISO standard, it must be conditioned by ILAC G19 [3] to make the accreditation relevant for forensic analysis.

41.2.5 For FSAs that involve scenes, the accreditation body will also utilise UKAS RG 201 [17] as part of the accreditation.

41.2.6 For interpretation and opinions, e.g. activity level interpretation, the accreditation body may also consider the utilisation of UKAS LAB 13 [74] as part of the accreditation.

41.2.7 Where applicable, FSA definitions will identify any appendices in the Code that set out specific requirements for that FSA, which condition accreditation to ISO standards.

41.2.8 Subject to the provisions below, forensic units shall demonstrate compliance with the Code by having accreditation to an appropriate ISO standard with the schedule of accreditation including the Code.

41.2.9 On the day the Code becomes effective, forensic units shall have accreditation for FSAs they undertake which have a requirement for accreditation. This accreditation does not need to include the Code in the schedule of accreditation on the day the Code becomes effective.

41.2.10 24 months past when the Code becomes effective (see section 10.1.3), forensic units shall have accreditation for FSAs they undertake which have a requirement for accreditation, and the schedule of accreditation shall include the Code.

41.2.11 In some FSAs there is allowance of a deferment to achieve accreditation, and this is clear in those FSAs.

42. General Requirements

42.1 Purpose

42.1.1 The definitions of FSAs will apply where the activity is undertaken for a purpose specified in s11(2) of the 2021 Act [10]. To achieve this requirement the following general requirements will apply to all FSA definitions.

42.2 Commissioning – Detection and/or Investigation of Crime

42.2.1 To fall within the purpose in s11(2)(a) 2021 Act [10] the following conditions apply.

42.2.2 The activity must have been originally commissioned by [160], or undertaken by (or on behalf of), one of the following persons with the aim that the output should be used for a purpose related to the detection and/or investigation of crime.

a. A law enforcement agency.

b. A prosecuting authority.

c. A suspect, accused, or convicted person (in relation to the offence for which they are suspected, accused, or convicted) where the relevant criminal investigation and/or prosecution was by a body listed in the sub-clauses above.

d. A legal representative of a person within the description in section c above.

e. A body with legal authority to investigate potential miscarriages of justice.

f. The Forensic Science Regulator.

42.2.3 The detection and/or investigation of crime means. [161]

a. Establishing whether a crime has occurred, has been attempted or is planned.

b. Establishing whether information related to the investigation of crime is accurate and eliminating the innocent from criminal investigations.

c. Establishing by whom, for what purpose, by what means, and generally in what circumstances any crime was, or may have been, committed. [162]

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160 If a forensic unit obtains externally provided services for an activity, which would fall within the purpose of s11(2)(a) it still falls within the purpose in s11(2)(a) 2021 Act.

161 The text is based on s39 Human Tissue Act 2004 [66].

162 This includes forensic science activities undertaken as part of covert policing activity.

d. Obtaining and recording such information as may be needed in the criminal investigation and prosecution of any offence. [163]

e. The apprehension of the person by whom any crime was committed.

42.2.4 Law enforcement agency means any of the following bodies, in relation to their work in England and Wales.

a. The forty-three territorial police forces in England and Wales. [164]

b. The limited territorial forces listed below.

i. Kew Constabulary.

ii. Mersey Tunnels Police.

iii. Port of Bristol Police.

iv. Port of Dover Police.

v. Port of Felixstowe Police.

vi. Port of Liverpool Police.

vii. Port of Tilbury Police.

viii. Tees and Hartlepool Harbour Police.

c. The non-territorial police forces listed below.

i. British Transport Police.

ii. Civil Nuclear Constabulary.

iii. Ministry of Defence Police.

d. The military law enforcement bodies set out below.

i. Royal Navy Police.

ii. Royal Military Police.

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163 Any work as part of the appeal process or investigation consequent of an appeal is within scope.

164 The reference to the territorial forces shall be taken to include any unit (for example a Counter Terrorism Unit or Regional Organised Crime Unit) which (a) includes, or is comprised of, constables from one of the territorial forces and (b) is not a separate legal entity from the force(s) from which the constable(s) come.

iii. Royal Air Force Police.

iv. Royal Marines Police.

e. Fire and Rescue Services.

f. The National Crime Agency.

g. The Serious Fraud Office.

h. HM Revenue and Customs.

i. The Home Office.

j. The Independent Office for Police Conduct.

k. The security and intelligence agencies listed below.

i. The Government Communications Headquarters.

ii. The Secret Intelligence Service.

iii. The Security Service.

l. Any person responsible for, or operating, the following databases.

i. The National DNA Database. [165]

ii. The National Forensic Footwear Database. [166]

iii. The National Ballistics Intelligence Service. [167]

iv. The National Fingerprint Database. [168]

42.2.5 A prosecuting authority means:

a. HM Attorney General;

b. The Director of Public Prosecutions;

c. The Crown Prosecution Service; and

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165 Overseen by Home Office Forensic Information Database Service.

166 Overseen by Home Office Forensic Information Database Service.

167 This is known as NaBIS.

168 Overseen by Home Office Forensic Information Database Service.

d. The Serious Fraud Office.

42.3 Commissioning – Preparation, Analysis or Presentation of Evidence

42.3.1 To fall within the purpose in s11(2)(b) 2021 Act [10] the following conditions apply.

42.3.2 The activity must have been commissioned by one of the following persons/bodies with the intention that the output is used for a purpose related to criminal proceedings.

a. A law enforcement agency.

b. A prosecuting authority.

c. A suspect, accused, or convicted person (in relation to the offence for which they are suspected, accused, or convicted) where the relevant criminal investigation and/or prosecution was by a body listed in the sub-clauses above.

d. A legal representative of a person within the description in section c above.

e. A body with legal authority to investigate potential miscarriages of justice.

f. The Forensic Science Regulator.

42.3.3 The term criminal proceedings means, subject to sections 42.3.4 and 42.3.5, any proceeding covered by the following provisions.

a. Section 51 of the Criminal Justice Act 2003 [85].

b. Section 14 of the Legal Aid, Sentencing and Punishment of Offenders Act 2012 [86].

42.3.4 The following proceedings shall not be considered ‘criminal proceedings’ for the purpose of this Code.

a. Proceedings for dealing with an individual under the Extradition Act 2003 [87].

b. Proceedings for binding an individual over to keep the peace or to be of good behaviour under section 115 of the Magistrates’ Courts Act 1980 [88] and for dealing with an individual who fails to comply with an order under that section.

c. Proceedings for contempt committed, or alleged to have been committed, by an individual in the face of a court.

d. Proceedings before the Judicial Committee of the Privy Council.

42.3.5 The term ‘criminal proceedings’ shall not cover any activities related to the imposition or management of a sentence imposed on a convicted person.

42.3.6 Where any activity that is commissioned for purposes other than those described in s11 2021 Act [10] (and therefore falling within the provisions set out above) and generates material which is subsequently of relevance to the CJS the initial work is not an FSA. Any work (e.g. any additional work, the production of reports or the presentation of evidence) commissioned for CJS use will be an FSA if it falls within the definitions in this Code.

42.4 Modification of Scope

42.4.1 The requirements stated in this version of the Code limit the scope of FSA to a subset of what the 2021 Act [10] states are FSA. The Regulator has determined that at the point of introduction of this Code this is appropriate, but future versions of the Code may revise the requirements above and, as a consequence, extend the scope of the FSA.

43. Contingency Capacity/Facility

43.1.1 This section applies where a forensic unit establishes and maintains a facility, or capability, which is:

a. To be used in the circumstance of a potential future event; [169]

b. Not currently performing any casework which would amount to an FSA; and

c. The work which would be undertaken, if the capacity/facility was brought into use, would amount to an FSA.

[169] For example, certain types of terrorist events or disasters involving existing facilities.

43.1.2 In these cases, the preparation and maintenance of the capacity/facility will itself be considered to be carrying on the FSA relevant to the work to be undertaken in the facility/capacity.

44. General Inclusions

44.1 General Activities

44.1.1 In all FSA definitions below, the following activities shall be assumed to be part of the definition unless the contrary is clearly stated in the definition.

a. The following aspects of the handling, continuity, and monitoring of any item/exhibit or material relevant to the activities listed in the section.

i. The packaging.

ii. The labelling.

iii. The transportation (covering all transportation from the time the item/exhibit is seized until it is returned to the owner or disposed of).

iv. The storage.

v. The integrity and security.

vi. The retention.

vii. The destruction.

b. The provisions set out in clause a shall also apply to any item/exhibit, material or information taken from, created from or derived from any item/exhibit or material relevant to the criminal investigation.

c. The recording of and note taking (including general photography) relating to any item/exhibit.

d. The provision of any advice, to a person or body listed in section 42 related to the use, including potential use, and potential contribution of an FSA to the criminal investigation of a specific matter.

e. In relation to the activities set out in the definition, any of the following aspects of assessment, interpretation, and/or reporting.

i. The case assessment process.

ii. The determination of the examination strategy.

iii. The interpretation of the findings to assess/determine the significance in light of the case circumstances/information provided.

iv. The reporting of the results of any activities and the interpretation to the commissioning party of the CJS.

v. The provision of evidence (whether evidence of fact or opinion) in relation to the activities (whether the activities were undertaken by or on behalf of the person providing the evidence).

vi. The provision of evidence of opinion as to the significance of the findings produced by the activities in the context of the case.

vii. The provision of any expert advice or evidence in relation to any activities listed in sections i to vi above.

f. The critical findings check.

g. The primary case review.

44.1.2 The forensic unit, in undertaking any FSA, may need to consider whether other evidence types may be of value, assess the prioritisation of such evidence types and the impact of any examination on other evidence types. This shall be considered part of the examination strategy in section 44.1.1.

44.2 Supporting Activities

44.2.1 All work necessary to provide, or support the provision of, the FSA listed in each definition forms part of that FSA and are subject to the applicable standards.

44.2.2 The activities which are necessary for, or support the provision of, the FSA covered in the definition include, but are not limited to, the following.

a. Ensuring all work is undertaken in a suitable environment and that:

i. the accommodation is constructed and maintained in an appropriate way.

ii. cleanliness is maintained at a level suitable for the work undertaken.

iii. appropriate anti-contamination processes are employed.

iv. where relevant, suitable environmental monitoring is undertaken.

v. appropriate security is maintained.

b. Ensuring all equipment employed is fit for purpose.

i. That suitable equipment is procured.

ii. That all equipment is subject to appropriate maintenance at pre-determined intervals.

iii. That all equipment is suitably calibrated.

c. That appropriate provisions are in place in relation to the following.

i. The physical security of the accommodation.

ii. The security of all IT systems.

iii. The security of information.

iv. The integrity and security clearance of personnel.

d. Ensuring that all methods employed have been appropriately validated for use.

e. Ensuring all persons undertaking work are competent.

i. That all persons undertaking work have sufficient training, qualifications and experience, and have satisfactorily demonstrated that they are able to carry out the work competently.

ii. That the ability of all persons to carry out the work to the relevant standards (i.e. competently) is maintained and regularly monitored.

f. Ensuring all reagents and consumables are fit for the purpose for which they are being used.

g. That all collections of information or material (e.g. reference databases) used to assist in the examination, analysis of items/exhibits, or the assessment/interpretation of results are fit for purpose.

45. General Exclusions

45.1 Knowledge

45.1.1 The forensic unit commissioned to perform the activity must, at the time the work is commissioned, be aware that the output is to be used for a purpose in s11 of the 2021 Act [10].[170]

45.2 Use of Animals

45.2.1 Any method which is based on the use of non-human animals (e.g. dogs) shall not be considered to form any part of an FSA.

45.3 Secretary of State Approval

Type Approval

45.3.1 Where any statute provides the Secretary of State the power to approve any equipment, or method, for use in circumstances which might fall within the scope of s11 2021 Act. [10] The following shall not be part of any FSA.

a. The process by which the Secretary of State determines whether to grant approval.

b. The process by which the Secretary of State determines whether to continue, suspend, or withdraw an existing approval.

c. Any work undertaken by, on behalf of, or commissioned by the Secretary of State to assist in the process of granting, suspending, continuing or withdrawing an approval.

Drug Testing Equipment

45.3.2 Home Office Circular 15/2012 [89] contains provisions about the testing of items/exhibits suspected of being drugs controlled under the Misuse of Drugs Act 1971 [90]. These provisions incorporate the use of kits approved by, or on behalf of, the Secretary of State. The following shall not be part of any FSA.

a. The process by which the Secretary of State, or persons acting on behalf of the Secretary of State, determines whether to grant approval.

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[170] The effect of this provision is that the forensic unit must understand at the time the work is being done, that the output will feed into the CJS or this Code does not apply.

b. The process by which the Secretary of State, or persons acting on behalf of the Secretary of State, determines whether to continue, suspend or withdraw an existing approval.

c. Any work undertaken by, on behalf of, or commissioned by the Secretary of State (or persons acting on behalf of the Secretary of State) to assist in the process of granting, suspending, continuing or withdrawing an approval.

F3 - FSAs – Definitions subject to this Code

46. FSA Definition – Incident Scene Examination

46.1 Definition

46.1.1 The examination of a location believed to be the scene of an incident to recognise and recover items, materials, and information relevant to the occurrence of alleged criminal activity that may subsequently be used as evidence.

46.1.2 This activity applies to a practitioner who is commissioned to carry out a planned examination of a scene and for whom this is their primary role.

46.2 Required Compliance

46.2.1 Compliance with this Code from the effective date of the Code (see 10.1.3).

46.2.2 Accreditation to ISO 17020 [2] from the effective date of the Code (see 10.1.3), for the sub-activities the organisation undertakes which are required to be on the accreditation scope.

46.2.3 Within 24 months of the effective date of the Code (see 10.1.3), the organisation must demonstrate compliance with the Code by having a schedule of accreditation that includes the Code and reflects all FSAs (or parts thereof) that the organisation undertakes.

46.3 Sub-Activities

46.3.1 The following sub-activities are considered to constitute ‘Incident Scene Examination’.

Sub-Activities to be included in accreditation scope

a. Consideration of the appropriate resource required to attend and examine an incident scene.

b. Scene control, management, setting of forensic strategy, and co-ordination at the incident including other related scene locations and attendance of specialists.

c. Examination of material and information in whatever form is necessary.

d. Enhancement and presumptive testing.

e. Interpretation of the observations at the scene.

46.4 Note

46.4.1 This FSA could apply at any of the following.

a. Any location which is believed to be a place where a criminal offence has occurred.

b. The location where a relevant item (e.g. a body) is found.

c. Any location where a relevant item is or is believed to be located (e.g. vehicle or physical item).

d. A location owned, occupied or under the control of any lay person of interest (e.g. complainant or suspected/accused person).

e. A location which is not the primary location of interest (e.g. a familial address).

f. Any mortuary (or other facility) where a post-mortem examination is undertaken.

46.5 Linked FSAs

46.5.1 The following FSAs are linked to this definition but are defined separately.

a. FSA Definition – Examination of Incidents Involving Vehicles (Section 84).

b. FSA Definition – Examination of Fire Scenes (Section 85).

c. FSA Definition – Examination to Establish the Origin and Cause of an Explosion (Section 86).

d. When conducted in a dedicated facility, Blood Pattern and Human Body Fluid Distribution Analysis is covered under the FSA outlined in Section 49. If Blood

Pattern and Human Body Fluid Distribution Analysis is conducted at a scene, it is covered under this FSA definition for Incident Scene Examination.

e. When conducted in a dedicated facility, FSA Definition – Data Capture and Processing from Digital Storage Devices is covered under the FSA outlined in Section 76. If Data Capture and Processing from Digital Storage Devices is conducted at a scene, it is covered under this FSA definition for Incident Scene Examination.

46.6 Excluded from this FSA but Included in other FSAs

46.6.1 The following do not fall within the definition of 'Incident Scene Examination' but are the subject of a different FSA definition.

a. Examination of Persons (See section 47, 87, 88).

b. FSA Definition – Human Biological Material Examination (Section 48).

c. FSA Definition – Human Body Fluid Distribution Analysis (Section 49).

d. FSA Definition – Friction Ridge Detail: Visualisation and Enhancement (Section 57).

e. FSA Definition – Marks Visualisation and Enhancement (Section 62).

46.7 Exclusions from this FSA and the Code

46.7.1 The following do not fall within the definition of 'Incident Scene Examination' and will not fall under the Code.

a. Activity undertaken to protect/preserve items/exhibits from imminent alteration or destruction unless by persons specifically commissioned to carry out an FSA as defined within this Code.

47. FSA Definition – Forensic Examination of Sexual Offence Complainants

47.1 Definition

47.1.1 Recovery of material (which may be subject to further testing) believed to be relevant to an alleged sexual offence committed against the complainant, undertaken in a dedicated facility (forensic unit) for that purpose.

47.2 Required Compliance

47.2.1 Compliance with the Code, including section 98 - Sexual Assault Examination: Requirements for the Assessment, Collection and Recording of Forensic Science Related Evidence, from the effective date of the Code (see 10.1.3).

47.2.2 Accreditation to ISO 15189 [18] by 24 months of the effective date of the Code (see 10.1.3), for the sub-activities the organisation undertakes which are required to be on the accreditation scope.

47.2.3 Within 24 months of the effective date of the Code (see 10.1.3) the organisation must demonstrate compliance with the Code by having a schedule of accreditation that includes the Code and reflects all FSAs (or parts thereof) that the organisation undertakes.

47.3 Sub-Activities

47.3.1 The following sub-activities are considered to constitute ‘Forensic Examination of Sexual Offence Complainants’.

Sub-Activities to be included in accreditation scope

a. The examination of material which may be evidence or give rise to evidence in an alleged offence under investigation.

i. Recording of material may include the use of image capture devices (including colposcopes) for specialist image capture/photo-documentation in general and intimate images, and/or the use of body diagrams/maps to record the presence, location, and measurements of injuries and marks, or the absence of injuries and marks.

ii. Material believed to be evidence may be biological or non-biological (which includes particulate trace material).

b. The recovery of items. This includes obtaining toxicology and drugs samples, and DNA reference samples.

i. This includes recovery to enable body fluid distribution analysis and/or interpretation to be carried out (see FSA Definition – Human

Body Fluid Distribution Analysis and FSA Definition – Incident Scene Examination).

47.4 Exclusions from this FSA and the Code

47.4.1 The following do not fall within the definition of ‘Forensic Examination of Sexual Offence Complainants' and will not fall under the Code.

a. An examination to determine whether someone is fit to be interviewed and/or examined.

b. The activities of a person other than the practitioner, who is taking steps to protect/preserve or collect evidence.

c. Clinical assessment and the provision of appropriate medical care, including treatment of injuries (general and specific, such as injuries sustained by female genital mutilation).

d. Taking dental impressions.

48. FSA Definition – Human Biological Material Examination

48.1 Definition

48.1.1 The examination and analysis of human biological material.

48.2 Required Compliance

48.2.1 Compliance with this Code from the effective date of the Code (see 10.1.3).

48.2.2 Accreditation to ISO 17025 [1] from the effective date of the Code (see 10.1.3), for the sub-activities the organisation undertakes which are required to be on the accreditation scope.

48.2.3 Within 24 months of the effective date of the Code (see 10.1.3) the organisation must demonstrate compliance with the Code by having a schedule of accreditation that includes the Code and reflects all FSAs (or parts thereof) that the organisation undertakes.

48.3 Sub-Activities

48.3.1 The following sub-activities, when conducted away from scene, are considered to constitute ‘Human Biological Material Examination’.

Sub-Activities to be included in accreditation scope

a. Visual screening and examination with the use of light sources of an appropriate wavelength and microscopic examination.

b. Recovery of human body fluid and biological material from items.

c. Body fluid analysis using presumptive testing and microscopical examination of human body fluid and biological material.

d. Enhancement of non-visible staining such as blood.

e. Hair and body fluid analysis.

f. Differentiation of human and animal hairs.

Sub-Activities not required to be included in accreditation scope

g. Analysis to determine somatic origin and/or ethnicity of hairs.

h. Consideration of the mechanism of deposition, including issues relating to transfer, persistence, prevalence, and recovery.

48.4 Note

48.4.1 The sub-activities may apply to mixtures of more than one body fluid or biological material.

48.5 Excluded from this FSA but Included in other FSAs

48.5.1 The following do not fall within the definition of ‘Human Biological Material Examination’ but are the subject of a different FSA definition.

a. FSA Definition – Human DNA Analysis (Section 50).

b. FSA Definition – Human Body Fluid Distribution Analysis (Section 49).

c. Examination of Persons (47, 87, 88).

d. FSA Definition – Incident Scene Examination (Section 46).

49. FSA Definition – Human Body Fluid Distribution Analysis

49.1 Definition

49.1.1 Analysis of the pattern of distribution of blood and/or body fluids to reconstruct and interpret activity in relation to an alleged criminal offence. This includes analysis from photographs or other media.

49.2 Required Compliance

49.2.1 Compliance with this Code from the effective date of the Code (see 10.1.3) including section 100 - Bloodstain Pattern Analysis.

49.2.2 Accreditation to ISO 17025 [1] from the effective date of the Code (see 10.1.3), for the sub-activities the organisation undertakes which are required to be on the accreditation scope.

49.2.3 Within 24 months of the effective date of the Code (see 10.1.3) the organisation must demonstrate compliance with the Code by having a schedule of accreditation that includes the Code and reflects all FSAs (or parts thereof) that the organisation undertakes.

49.3 Sub-Activities

49.3.1 The following activities, when conducted away from scene, subject to the provisions below, shall be considered to constitute ‘Human Body Fluid Distribution Analysis’.

Sub-Activities to be included in accreditation scope

a. Visual examination for human body fluids including, but not limited to, blood, semen, and saliva.

i. Visualisation includes the use of light sources of an appropriate wavelength and/or chemical enhancement, especially of non-visible staining or presumptive testing.

b. The recording of material which may be evidence or give rise to evidence, through specialist image capture (including 3D imaging and video), examination notes, and/or measurements.

c. Blood pattern analysis for reconstruction and to provide opinion at the activity level.

Sub-Activities not required to be included in accreditation scope

d. Consideration of the form, morphology, and distribution or level of body fluid (excluding blood) staining to provide opinion at the activity level.

49.4 Excluded from this FSA but Included in other FSAs

49.4.1 The following do not fall within the definition of ‘Human Body Fluid Distribution Analysis’ but are the subject of a different FSA definition.

a. FSA Definition – Human DNA Analysis (Section 50).

b. FSA Definition – Human Biological Material Examination (Section 48).

c. FSA Definition – Incident Scene Examination (Section 46).

50. FSA Definition – Human DNA Analysis

50.1 Definition

50.1.1 The use of DNA methods applicable to human biological material to determine the potential source(s).

50.2 Required Compliance

50.2.1 Compliance with this Code from the effective date of the Code (see 10.1.3), including section 99 - DNA Analysis.

50.2.2 Accreditation to ISO 17025 [1] from the effective date of the Code (see 10.1.3), for the sub-activities the organisation undertakes which are required to be on the accreditation scope.

50.2.3 Within 24 months of the effective date of the Code (see 10.1.3) the organisation must demonstrate compliance with the Code by having a schedule of accreditation that includes the Code and reflects all FSAs (or parts thereof) that the organisation undertakes.

50.3 Sub-Activities

50.3.1 The following sub-activities are considered to constitute ‘Human DNA Analysis’.

Sub-Activities to be included in accreditation scope

a. The extraction, purification, and, where applicable, quantification of DNA, including the use of PCR and fragment separation (e.g. by electrophoresis).

i. DNA quantification is not required for reference samples (including hairs, liquid blood, and buccal swaps) from persons.

b. Sequencing of DNA and production of Autosomal DNA/Haplotype profiles.

c. Profile interpretation, including designation and comparison for single source and DNA mixtures.

d. Statistical analysis up to and including the point of generating a likelihood ratio.

e. Quality assurance checks, including batch contamination, checks against DNA elimination databases, profile designation, and sample switch checks.

f. The use of reference and population databases (see 31).

g. Submitting results to DNA databases.

50.4 Excluded from this FSA but Included in other FSAs

50.4.1 The following do not fall within the definition of ‘Human DNA Analysis’ but are the subject of a different FSA definition.

a. FSA Definition – Human Biological Material Examination (Section 48).

b. FSA Definition – Human Kinship Analysis (Section 51).

51. FSA Definition – Human Kinship Analysis

51.1 Definition

51.1.1 The use of outputs of DNA analysis to determine the biological relationship from within a closed set of individuals.

51.2 Required Compliance

51.2.1 Compliance with this Code from the effective date of the Code (see 10.1.3).

51.2.2 Accreditation to ISO 17025 [1] from the effective date of the Code (see 10.1.3), for the sub-activities the organisation undertakes which are required to be on the accreditation scope.

51.2.3 Within 24 months of the effective date of the Code (see 10.1.3) the organisation must demonstrate compliance with the Code by having a schedule of accreditation that includes the Code and reflects all FSAs (or parts thereof) that the organisation undertakes.

51.3 Sub-Activities

51.3.1 The following sub-activities are considered to constitute ‘Human Kinship Analysis’.

Sub-Activities to be included in accreditation scope

a. The selection of autosomal, haplotype and/or mitochondrial technologies to conduct paternity and/or biological relationship analysis.

b. Profile/sequence designation and comparison.

c. Statistical analysis, including the use of population reference databases (see 31.

d. Quality assurance checks, including designation checks, pedigree build, reference data used and calculations.

e. Submitting results to DNA databases.

f. Disaster Victim Identification.

51.4 Excluded from this FSA but Included in other FSAs

51.4.1 The following do not fall within the definition of ‘Human Kinship Analysis’ but are the subject of a different FSA definition.

a. FSA Definition – Human DNA Analysis (Section 50).

51.5 Exclusions from this FSA and the Code

51.5.1 The following do not fall within the definition of ‘Human Kinship Analysis’ and will not fall under the Code.

a. Disaster victim identification for natural mass disasters.

b. Civil paternity.

52. FSA Definition – Non-Human Biological Examination: Vertebrates

52.1 Definition

52.1.1 Analysis to determine the species and/or the potential source of non-human vertebrate material.

52.2 Required Compliance

52.2.1 Compliance with this Code from the effective date of the Code (see 10.1.3).

52.2.2 Accreditation to ISO 17025 [1] from the effective date of the Code (see 10.1.3), for the sub-activities the organisation undertakes which are required to be on the accreditation scope.

52.2.3 Within 24 months of the effective date of the Code (see 10.1.3) the organisation must demonstrate compliance with the Code by having a schedule of accreditation that includes the Code and reflects all FSAs (or parts thereof) that the organisation undertakes.

52.3 Sub-Activities

52.3.1 The following sub-activities are considered to constitute ‘Non-Human Biological Examination: Vertebrates’.

Sub-Activities to be included in accreditation scope

a. DNA analysis for species identification, individual profiling, and pedigree analysis, including:

i. Recovery of DNA;

ii. The extraction and purification of DNA, including, but not limited to, the use of PCR (dependent on the investigative question) and electrophoresis;

iii. Processing of the PCR result, including sequencing and genotyping depending on the test applied; and

iv. The comparison, interpretation including use of reference databases (see 31), and statistical analysis.

Sub-Activities not required to be included in accreditation scope

b. Morphological examination of relevant material to determine species or the potential source of non-human material.

c. Macroscopic, microscopic, and immunological tests to determine the species.

52.4 Note

52.4.1 Relevant material refers to any part of a vertebrate, including hair, skin, teeth, bone, scales, feather, and processed products such as traditional medicines.

52.5 Excluded from this FSA but Included in other FSAs

52.5.1 The following do not fall within the definition of ‘Non-Human Biological Examination: Vertebrates’ but are the subject of a different FSA definition.

a. FSA Definition – Human DNA Analysis (Section 50).

b. FSA Definition – Non-Human Biological Examination: Plants, Microbes, and Invertebrates (Section 89).

c. FSA Definition – Incident Scene Examination (Section 46).

52.6 Exclusions from this FSA and the Code

52.6.1 The following do not fall within the definition of ‘Non-Human Biological Examination: Vertebrates’ and will not fall under the Code.

a. Analysis to determine geographical provenance of non-human vertebrate material.

b. Bone and teeth examination and analysis to determine whether material is human or non-human.

53. FSA Definition – Toxicology: Analysis for Drug(s), Alcohol, and/or Noxious Substances

53.1 Definition

53.1.1 Analysis of human biological material to determine the presence of drug(s), drug metabolites, alcohol, and/or noxious substances (including poisons) or their metabolites, and if relevant the concentration of the drug, alcohol, or noxious substance and/or metabolites.

53.1.2 This section applies whether or not the person was alive at the time the material was separated from the body or body part.

53.2 Required Compliance

53.2.1 Compliance with this Code from the effective date of the Code (see 10.1.3).

53.2.2 Accreditation to ISO 17025 [1] or ISO 15189 [18] from the effective date of the Code (see 10.1.3), for the sub-activities the organisation undertakes which are required to be on the accreditation scope.

53.2.3 Within 24 months of the effective date of the Code (see 10.1.3) the organisation must demonstrate compliance with the Code by having a schedule of accreditation that includes the Code and reflects all FSAs (or parts thereof) that the organisation undertakes.

53.3 Sub-Activities

53.3.1 The following sub-activities are considered to constitute ‘Toxicology: Analysis for Drug(s), Alcohol, and/or Noxious Substances’.

Sub-Activities to be included in accreditation scope

a. The analysis (whether qualitative or quantitative) of material believed to originate from a human body (or part thereof) for any drug, alcohol, or noxious substance (including poison) or their metabolites.

b. Any analysis which is required in connection with or to assist in understanding of the observations obtained. Examples include, but are not limited to, analysis to determine the concentration of preservatives in any sample.

c. Classification/identification including use of reference databases (see 31).

Sub-Activities not required to be included in accreditation scope

d. Consideration of any of the following areas:

i. the effect (or possible effect) in general terms of any drug(s), alcohol, or noxious substance(s) (including poisons) on an individual.

ii. the manner in which the concentration of any drug(s), alcohol, or noxious substance(s) (including poisons), varies in an individual with respect to absorption, distribution, metabolism, elimination, tolerance, and/or degradation.

iii. the interpretation of drug concentrations with respect to abuse/therapeutic/toxic/fatal levels.

53.4 Excluded from this FSA but Included in other FSAs

53.4.1 The following do not fall within the definition of 'Toxicology: Analysis for Drug(s), Alcohol, and/or Noxious Substances' but are the subject of a different FSA definition.

a. FSA Definition – Toxicology: Analysis for Drugs and Alcohol under the Road Traffic Act 1988, Transport and Works Act 1992, and Railways and Transport Safety Act 2003 (Section 54).

b. FSA Definition – Toxicology: Analysis for Drugs in Relation to s5A of the Road Traffic Act 1988 (Section 55).

c. FSA Definition – Analysis to Identify and Quantify Drugs and/or Associated Materials (Section 56).

53.5 Exclusions from this FSA and the Code

53.5.1 The following do not fall within the definition of 'Toxicology: Analysis for Drug(s), Alcohol, and/or Noxious Substances' and will not fall under the Code.

a. The analysis of breath for alcohol for road traffic law purposes by any of the following:

i. a type approved roadside screening device.

ii. a type approved instrument for evidential purposes.

b. The analysis of any bodily material for any drugs (other than alcohol) for road traffic law and transportation safety purposes, as long as the results shall not be

used as the primary evidence of the concentration of any drug found in the CJS, by any of the following:

i. a type approved roadside screening device.

ii. presumptive drug tests at roadside.

c. The provision of any evidence in relation to whether a particular compound (or group or class of compounds) is a psychoactive substance in relation to the provisions of the Psychoactive Substances Act 2016 [91].

54. FSA Definition – Toxicology: Analysis for Drugs and Alcohol under the Road Traffic Act 1988, Transport and Works Act 1992, and Railways and Transport Safety Act 2003

54.1 Definition

54.1.1 Analysis of blood and/or urine for the detection and quantification of drugs, drug metabolites, and alcohol in relation to s4 Road Traffic Act 1988 [92], s5 Road Traffic Act 1988 [92], s27 Transport and Works Act 1992 [93], s28 Transport and Works Act 1992 [93], s78 Railways and Transport Safety Act 2003 [94], and/or s92 Railways and Transport Safety Act 2003 [94].

54.2 Required Compliance

54.2.1 Compliance with this Code from the effective date of the Code (see 10.1.3).

54.2.2 Accreditation to ISO 17025 [1] or ISO 15189 [18] from the effective date of the Code (see 10.1.3), for the sub-activities the organisation undertakes which are required to be on the accreditation scope.

54.2.3 Within 24 months of the effective date of the Code (see 10.1.3) the organisation must demonstrate compliance with the Code by having a schedule of accreditation that includes the Code and reflects all FSAs (or parts thereof) that the organisation undertakes.

54.3 Sub-Activities

54.3.1 The following sub-activities are considered to constitute ‘Toxicology: Analysis for Drugs and Alcohol under the Road Traffic Act 1988, Transport and Works Act 1992, and Railways and Transport Safety Act 2003’.

Sub-Activities to be included in accreditation scope

a. The analysis of a blood or urine sample to determine the presence, and where possible concentration, of any drug (and/or drug metabolite) and alcohol with the intention that the results be used in an investigation or prosecution (the use in a prosecution includes use by the defence) under:

i. s4 Road Traffic Act 1988 [92];

ii. s5 Road Traffic Act 1988 [92];

iii. s27 Transport and Works Act 1992 [93];

iv. s28 Transport and Works Act 1992 [93];

v. s78 Railways and Transport Safety Act 2003 [94]; and/or

vi. s92 Railways and Transport Safety Act 2003 [94].

b. Any analysis which is required in connection with or to assist in understanding of the observations described above.

c. Classification/identification including use of reference databases (see 31).

d. Consideration of whether, in a given time frame, the concentration of a drug exceeded a legal limit.

Sub-Activities not required to be included in accreditation scope

e. Consideration of any of the following areas.

i. whether a drug could have affected the behaviour or ability of the subject.

ii. whether the drug may have had an effect on the behaviour or abilities of the person from whom the sample was taken.

54.4 Excluded from this FSA but Included in other FSAs

54.4.1 The following do not fall within the definition of ‘Toxicology: Analysis for Drugs and Alcohol under the Road Traffic Act 1988, Transport and Works Act 1992,

and Railways and Transport Safety Act 2003' but are the subject of a different FSA definition.

a. FSA Definition – Toxicology: Alcohol Technical Calculations (Section 90).

b. FSA Definition – Toxicology: Analysis for Drug(s), Alcohol, and/or Noxious Substances (Section 53).

c. FSA Definition – Toxicology: Analysis for Drugs in Relation to s5A of the Road Traffic Act 1988 (Section 55).

54.5 Exclusions from this FSA and the Code

54.5.1 The following do not fall within the definition of 'Toxicology: Analysis for Drugs and Alcohol under the Road Traffic Act 1988, Transport and Works Act 1992, and Railways and Transport Safety Act 2003' and will not fall under the Code.

a. The testing of a suspect by a police officer using type approved 'roadside' equipment.

b. The testing of a suspect by a police officer using type approved evidential breath alcohol equipment.

55. FSA Definition – Toxicology: Analysis for Drugs in Relation to s5A of the Road Traffic Act 1988

55.1 Definition

55.1.1 Analysis of blood and/or urine for the detection and quantification of drugs in relation to s5A of the Road Traffic Act 1988 [92].

55.2 Required Compliance

55.2.1 Compliance with this Code from the effective date of the Code (see 10.1.3), including section 103 - The Analysis and Reporting of Forensic Specimens for s5A of the Road Traffic Act 1988.

55.2.2 Accreditation to ISO 17025 [1] or ISO 15189 [18] from the effective date of the Code (see 10.1.3), for the sub-activities the organisation undertakes which are required to be on the accreditation scope.

a. The analysis of whole blood samples for s5A Road Traffic Act 1988 [92] shall be specifically listed in the scope of accreditation.

b. A forensic unit should have the drugs it analyses for in relation to s5A [92] listed in the relevant section of its scope within 18 months of the later of (a) this document coming into effect or (b) a limit being established for that drug in the jurisdiction within which the laboratory operates. [171] [172]

c. The forensic unit shall comply with the provisions of this document in relation to all drugs analysed for the purposes of section 5A [92] regardless of whether they are listed in the schedule of accreditation.

55.2.3 Within 24 months of the effective date of the Code (see 10.1.3) the organisation must demonstrate compliance with the Code by having a schedule of accreditation that includes the Code and reflects all FSAs (or parts thereof) that the organisation undertakes.

55.3 Sub-Activities

55.3.1 The following sub-activities are considered to constitute 'Toxicology: Analysis for Drugs in relation to s5A of the Road Traffic Act 1988'.

Sub-Activities to be included in accreditation scope

a. The analysis of a blood or urine sample to determine the presence and/or concentration of any drug subject to a legal limit under The Drug Driving (Specified Limits) (England and Wales) Regulations 2014 [95] with the intention that the results be used in an investigation or prosecution under s5A Road Traffic Act 1988 [92].

i. The use in a prosecution includes use by the defence.

b. Analysis to determine whether the concentration of the relevant drug is higher than the applicable legal limit.

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171 The date on which limits were first established for each drug are provided in Annex A.

172 The forensic unit is responsible for ensuring those commissioning its services in relation to s5A [92] are aware of the drugs which will be analysed for either in general or in any sample where the general provisions are not applicable.

c. The consideration of factors that might impact on uncertainty of the results, and the potential impact of the uncertainty and the determination of whether the sample was over the applicable legal limit.

d. Any analysis which is required in connection with or to assist in understanding of the observations obtained above.

e. Classification/identification including use of reference databases (see 31).

55.4 Excluded from this FSA but Included in other FSAs

55.4.1 The following do not fall within the definition of ‘Toxicology: Analysis for drugs under s5A of the Road Traffic Act 1988’ but are the subject of a different FSA definition.

a. FSA Definition – Toxicology: Analysis for Drugs and Alcohol under the Road Traffic Act 1988, Transport and Works Act 1992, and Railways and Transport Safety Act 2003 (Section 54).

55.5 Exclusions from this FSA and the Code

55.5.1 The following shall not fall within the definition ‘Toxicology: Analysis for drugs under s5A of the Road Traffic Act 1988’ and will not fall under the Code.

a. The testing of a suspect by a police officer with type approved ‘roadside’ testing equipment.

56. FSA Definition – Analysis to Identify and Quantify Drugs and/or Associated Materials

56.1 Definition

56.1.1 Analysis, quantification, and legal classification of drugs, psychoactive substances, and/or associated materials.

56.2 Required Compliance

56.2.1 Compliance with this Code from the effective date of the Code (see 10.1.3).

56.2.2 Accreditation to ISO 17025 [1] from the effective date of the Code (see 10.1.3), for the sub-activities the organisation undertakes which are required to be on the accreditation scope.

56.2.3 Within 24 months of the effective date of the Code (see 10.1.3) the organisation must demonstrate compliance with the Code by having a schedule of accreditation that includes the Code and reflects all FSAs (or parts thereof) that the organisation undertakes.

56.3 Sub-Activities

56.3.1 The following sub-activities are considered to constitute ‘Analysis to Identify and Quantify Drugs and/or Associated Materials’.

Sub-Activities to be included in accreditation scope

a. Measuring the quantity of the material.

b. Selecting a portion of the submitted material for analysis.

c. Examination and recovery of traces of a relevant substance or associated material.

d. The analysis of any material to determine whether it contains or is a relevant substance or associated material.

e. Classification/identification including use of reference databases (see 31).

f. Quantification of the proportion of material which is a relevant substance (‘purity’) where appropriate.

g. Providing the legal classification of any relevant substances according to the Misuse of Drugs Act 1971 [90] and/or the Psychoactive Substances Act 2016 [91].

56.4 Note

a. In this section the term ‘relevant substance’ means anything falling within the descriptions below:

i. any substance which is listed (by name or by virtue of its chemical structure) in any Schedule to the Misuse of Drugs Act 1971 [90]; and/or

ii. any substance which is a psychoactive substance within the provisions of the Psychoactive Substances Act 2016 [91].

b. In this section the term ‘associated material(s)’ includes cutting agents, additives, and diluents.

56.4.2 All drugs for which the forensic unit routinely tests (in relation to the Misuse of Drugs Act 1971 [90] and/or Psychoactive Substances Act 2016 [91]) shall be within its scope of accreditation (either by being named in the scope or as a result of flexible scope) and new drugs, as they become more common, shall be brought within the scope in a timely fashion.

56.5 Excluded from this FSA but Included in other FSAs

56.5.1 The following do not fall within the definition of ‘Analysis to Identify and Quantify Drugs and/or Associated Materials’ but are the subject of a different FSA definition.

a. FSA Definition – Toxicology: Analysis for Drug(s), Alcohol, and/or Noxious Substances (Section 53).

b. FSA Definition – Friction Ridge Detail: Visualisation and Enhancement (Section 57).

c. FSA Definition – Human DNA Analysis (Section 50).

d. FSA Definition – Examination and Analysis relating to the Preparation and Production of Drugs and/or Psychoactive Substances (Section 91).

56.6 Exclusions from this FSA and the Code

56.6.1 The following do not fall within the definition of ‘Analysis to Identify and Quantify Drugs and/or Associated Materials’ and will not fall under the Code.

a. The testing of any item, or part thereof, to determine whether it is comprised of or contains a relevant substance:

i. with a Home Office approved kit under the processes permitted by a Home Office Circular;

ii. with a Home Office approved kit under the processes set out in the Evidential Drug Identification Testing (EDIT) programme.

b. The identification of cannabis under any process permitted by a Home Office Circular or the EDIT Programme.

c. The provision of any evidence in relation to the psychoactivity of a particular compound (or group or class of compounds) in relation to the provisions of the Psychoactive Substances Act 2016 [91].

d. The screening of items for drugs at an airport or other transport hub.

e. Drugs value estimation.

57. FSA Definition – Friction Ridge Detail: Visualisation and Enhancement

57.1 Definition

57.1.1 Application of methods to suspected areas of friction ridge detail to visualise and enhance marks to improve the level of detail in marks to support comparisons to be carried out.

57.2 Required Compliance

57.2.1 Compliance with this Code, including section 101 - Friction Ridge Detail: Visualisation , from the effective date of the Code (see 10.1.3).

57.2.2 Accreditation to ISO 17025 [1] from the effective date of the Code (see 10.1.3), for the sub-activities the organisation undertakes which are required to be on the accreditation scope.

57.2.3 Within 24 months of the effective date of the Code (see 10.1.3) the organisation must demonstrate compliance with the Code by having a schedule of accreditation that includes the Code and reflects all FSAs (or parts thereof) that the organisation undertakes.

57.3 Sub-Activities

57.3.1 The following sub-activities are considered to constitute ‘Friction Ridge Detail: Visualisation and Enhancement’.

Sub-Activities to be included in accreditation scope

a. The macroscopic or magnified analysis of an area of friction ridge detail, either latent or visible, to determine a method, or sequence of methods, that

could be utilised to most effectively enhance and reveal friction ridge detail within that area.

b. The application of the determined method(s). Methods can be physical in nature (e.g., light sources or powder application), or chemical.

c. The macroscopic or magnified consideration of the outcome of the application of the determined method(s) to assess whether they have performed as expected and remedial action if they have not.

d. Marking up relevant detail.

e. The use of specialist lighting, camera settings, optics, and other digital systems to optimise image capture.

f. When necessary, digital enhancement to facilitate comparison using post-capture image processing to appropriately compensate for perceived failings in the image.

g. Capture and recording of the friction ridge detail.

Sub-Activities not required to be included in accreditation scope

h. The macroscopic or magnified analysis of an area of friction ridge detail to determine the activity that caused the deposition.

57.4 Excluded from this FSA but Included in other FSAs

57.4.1 The following do not fall within the definition of ‘Friction Ridge Detail: Visualisation and Enhancement’ but are the subject of a different FSA definition.

a. FSA Definition – Friction Ridge Detail: Comparison (Section 58).

b. FSA Definition – Human DNA Analysis (Section 50) and FSA Definition – Analysis to Identify and Quantify Drugs and/or Associated Materials (Section 56) (i.e. Any chemical or biological analysis of the material comprising or found within the friction ridge detail).

58. FSA Definition – Friction Ridge Detail: Comparison

58.1 Definition

58.1.1 Comparison of friction ridge detail including from digits (fingers, thumbs and toes), palm or plantar, to exclude or support same source.

58.1.2 This definition should be taken to refer to friction ridge detail from persons living or deceased.

58.1.3 This definition also applies where friction ridge skin has become detached from its host through injury.

58.2 Required Compliance

58.2.1 Compliance with this Code, including section 102 - Friction Ridge Detail: Comparison, from the effective date of the Code (see 10.1.3).

58.2.2 Accreditation to ISO 17025 [1] from the effective date of the Code (see 10.1.3), for the sub-activities the organisation undertakes which are required to be on the accreditation scope.

58.2.3 Within 24 months of the effective date of the Code (see 10.1.3) the organisation must demonstrate compliance with the Code by having a schedule of accreditation that includes the Code and reflects all FSAs (or parts thereof) that the organisation undertakes.

58.3 Sub-Activities

58.3.1 The following sub-activities are considered to constitute ‘Friction Ridge Detail: Comparison’.

Sub-Activities to be included in accreditation scope

a. The macroscopic or magnified comparison of two areas of friction ridge detail, howsoever made and presented, to determine whether or not they originated from the same source. This includes print to print, print to mark, mark to print, and mark to mark, and the use of virtual digital images.

b. The interrogation of a friction ridge detail database(s).

c. The provision of a source level result.

Sub-Activities not required to be included in accreditation scope

d. The consideration of an area of friction ridge detail to determine the activity or handling that caused the deposition.

58.4 Excluded from this FSA but Included in other FSAs

58.4.1 The following do not fall within the definition of ‘Friction Ridge Detail: Comparison’ but are the subject of a different FSA definition.

a. FSA Definition – Incident Scene Examination (Section 46).

b. FSA Definition – Friction Ridge Detail: Visualisation and Enhancement (Section 57).

c. FSA Definition – Marks Visualisation and Enhancement(Section 62).

59. FSA Definition – Footwear: Coding and Scene Linking

59.1 Definition

59.1.1 The provision of information to link incident scenes through the consideration of footwear impressions recovered from those various scenes.

59.2 Required Compliance

59.2.1 Compliance with this Code from the effective date of the Code (see 10.1.3).

59.2.2 Accreditation to ISO 17025 [1] from the effective date of the Code (see 10.1.3), for the sub-activities the organisation undertakes which are required to be on the accreditation scope.

59.2.3 Within 24 months of the effective date of the Code (see 10.1.3) the organisation must demonstrate compliance with the Code by having a schedule of accreditation that includes the Code and reflects all FSAs (or parts thereof) that the organisation undertakes.

59.3 Sub-Activities

59.3.1 The following sub-activities are considered to constitute ‘Footwear: Coding and Scene Linking’.

Sub-Activities to be included in accreditation scope

a. Enhancement of footwear marks as is considered appropriate and proportionate to the case in question.

b. The macroscopic consideration of the footwear mark(s) received.

c. The use of a reference database (see 31) to:

i. identify the undersole pattern represented in the mark by reference to an alpha-numeric code which ordinarily indicates manufacturer and style/model of footwear; and/or

ii. identify other occurrences of the undersole pattern at other scenes.

59.4 Note

59.4.1 Footwear marks does not include footwear prints taken in custody.

59.5 Excluded from this FSA but Included in other FSAs

59.5.1 The following do not fall within the definition of ‘Footwear: Coding and Scene Linking’ but are the subject of a different FSA definition.

a. FSA Definition – Human DNA Analysis (Section 50) and FSA Definition – Analysis to Identify and Quantify Drugs and/or Associated Materials (Section 56) (i.e. Any chemical or biological analysis of the material comprising or found within the mark(s)).

b. FSA Definition – Footwear Mark Comparisons (Section 61).

c. FSA Definition – Incident Scene Examination (Section 46).

d. FSA Definition – Damage and Physical Fit (Section 64).

60. FSA Definition – Footwear: Screening

60.1 Definition

60.1.1 The analysis of whether or not items of footwear or known prints from pertinent footwear could have made footwear marks recovered from one or more scene, with a view to recommending whether or not a comparison is carried out, under the FSA Definition – Footwear Mark Comparisons.

60.2 Required Compliance

60.2.1 Compliance with this Code from the effective date of the Code (see 10.1.3).

60.2.2 Accreditation to ISO 17025 [1] from the effective date of the Code (see 10.1.3), for the sub-activities the organisation undertakes which are required to be on the accreditation scope.

60.2.3 Within 24 months of the effective date of the Code (see 10.1.3) the organisation must demonstrate compliance with the Code by having a schedule of accreditation that includes the Code and reflects all FSAs (or parts thereof) that the organisation undertakes.

60.3 Sub-Activities

60.3.1 The following sub-activities are considered to constitute ‘Footwear: Screening’.

Sub-Activities to be included in accreditation scope

a. The examination of one or more items of footwear pertinent to:

i. a detained person or persons;

ii. a person or persons suspected of involvement in crime;

iii. a location relevant to anyone covered in (i) and (ii) above; and/or

iv. an individual who has legitimate access to the scene of incident.

b. Reference to/operation of a database to determine the undersole pattern present on the submitted footwear item(s) (see 31).

c. The production of appropriate test impressions from the footwear in question.

d. The receipt of footwear marks, in whatever format and howsoever produced, from one or more incident scenes. This includes receipt of items, recovered from incident scenes, which bear footwear marks.

e. Any necessary recovery or recording of the submitted mark(s).

f. Enhancement of the submitted marks as necessary.

g. The macroscopic examination of the footwear mark(s) received.

h. The provision of a report recommending, or not, whether a full comparison can and/or should be carried out. This could include consideration of damage on the sole of the shoe when making the decision to submit for comparison.

60.4 Note

60.4.1 Screening can involve:

a. One or more items of footwear, whether recovered from individuals suspected of involvement of an incident or incidents under investigation, or from locations associated with those individuals.

b. One or more items of footwear, or test impressions taken from the footwear, of individuals known to have had legitimate access to the scene of incident.

60.4.2 Screening does not include an assessment of evidential strength.

60.4.3 Screening submissions may be the result of Coding and Scene Linking activities such as are described in FSA Definition – Footwear: Coding and Scene Linking (Section 59). Screening activities as described in this FSA can lead to comparisons as described in FSA Definition – Footwear Mark Comparisons (Section 61).

60.5 Excluded from this FSA but Included in other FSAs

60.5.1 The following do not fall within the definition of 'Footwear: Screening' but are the subject of another FSA definition as indicated.

a. FSA Definition – Footwear Mark Comparisons (Section 61).

b. FSA Definition – Human DNA Analysis (Section 50) and FSA Definition – Analysis to Identify and Quantify Drugs and/or Associated Materials (Section 56) (i.e. Any chemical or biological analysis of the material comprising or found within the mark(s)).

c. FSA Definition – Damage and Physical Fit (Section 64).

d. FSA Definition – Incident Scene Examination (Section 46).

61. FSA Definition – Footwear Mark Comparisons

61.1 Definition

61.1.1 The analysis to determine whether or not items of footwear could have contributed to the generation of footwear marks recovered from one or more scene, and the evaluation of evidential strength.

61.2 Required Compliance

61.2.1 Compliance with this Code from the effective date of the Code (see 10.1.3).

61.2.2 Accreditation to ISO 17025 [1] from the effective date of the Code (see 10.1.3), for the sub-activities the organisation undertakes which are required to be on the accreditation scope.

61.2.3 Within 24 months of the effective date of the Code (see 10.1.3) the organisation must demonstrate compliance with the Code by having a schedule of accreditation that includes the Code and reflects all FSAs (or parts thereof) that the organisation undertakes.

61.3 Sub-Activities

61.3.1 The following sub-activities are considered to constitute 'Footwear Mark Comparison'.

Sub-Activities to be included in accreditation scope

a. The examination of one or more items of footwear pertinent to:

i. a detained person(s) and/or a person(s) suspected of involvement in crime;

ii. a person with legitimate access including witnesses, emergency service personnel, and complainants; and/or

iii. a location relevant to anyone covered in (i) and (ii) above.

b. Reference to/operation of a database (see 31) to determine the undersole pattern present on the submitted footwear item(s).

c. The production of appropriate test impressions from the submitted footwear.

d. The analysis of footwear marks, in whatever format and howsoever produced, from one or more incident scenes. This includes receipt of items, recovered from incident scenes which bear footwear marks.

e. Enhancement of the submitted mark(s) as necessary.

f. The macroscopic and/or magnified examination of the footwear mark(s) received.

g. A macroscopic and/or magnified comparison between the submitted footwear, or test impressions from the submitted footwear, and marks from incident scenes to determine areas of agreement and difference.

h. Interpretation of the source of the footwear mark.

Sub-Activities not required to be included in accreditation scope

i. Interpretation of the activity leading to the deposition of the footwear mark.

61.4 Note

61.4.1 Comparison can cover:

a. One or more items of footwear, or test impressions take from the footwear, whether recovered from individuals suspected of involvement of an incident or incidents under investigation, or from locations associated with those individuals.

b. One or more items of footwear, or test impressions taken from the footwear, of individuals known to have had legitimate access to the scene of incident.

c. Comparison of footwear as described at (a) and (b) above with one or more marks recovered from one or more scenes of incident or injury marks.

61.4.2 Comparison may come about as a direct consequence of an investigation, or it may follow on from Coding and Screening activities such as are described in FSA Definition – Footwear: Coding and Scene Linking (Section 59) and FSA Definition – Footwear: Screening (Section 60) respectively. Those FSAs should be read in conjunction with this.

61.5 Excluded from this FSA but Included in other FSAs

61.5.1 The following do not fall within the definition of ‘Footwear Mark Comparison’ but are the subject of a different FSA definition.

a. FSA Definition – Incident Scene Examination (Section 46).

b. FSA Definition – Human DNA Analysis (Section 50) and FSA Definition – Analysis to Identify and Quantify Drugs and/or Associated Materials (Section 56) (i.e. Any chemical or biological analysis of the material comprising or found within the mark(s)).

62. FSA Definition – Marks Visualisation and Enhancement

62.1 Definition

62.1.1 The application of methods to visualise latent marks and to improve the level of detail in indistinct marks, to enable more reliable comparisons to be made and more robust evidence to be provided.

62.1.2 This FSA excludes Friction Ridge Detail (see sections 57, 58) and Footwear marks (see sections 59, 60, 61), and includes other marks (e.g. toolmarks).

62.2 Required Compliance

62.2.1 Compliance with this Code from the effective date of the Code (see 10.1.3).

62.2.2 Accreditation to ISO 17025 [1] from the effective date of the Code (see 10.1.3), for the sub-activities the organisation undertakes which are required to be on the accreditation scope.

62.2.3 Within 24 months of the effective date of the Code (see 10.1.3) the organisation must demonstrate compliance with the Code by having a schedule of accreditation that includes the Code and reflects all FSAs (or parts thereof) that the organisation undertakes.

62.3 Sub-Activities

62.3.1 The following sub-activities are considered to constitute ‘Marks: Visualisation and Enhancement’.

Sub-Activities to be included in accreditation scope

a. The macroscopic or microscopic examination of a relevant area where a mark, either latent or visible, may be present to determine a method, or sequence of methods, that could be employed to most effectively reveal further detail within that area.

b. The application of the determined method(s) (e.g. lighting/chemical). This includes image capture methods.

c. The macroscopic or microscopic consideration of the outcome of the application of the determined method(s) to assess whether they have performed as expected and remedial action if they have not.

d. Analysis to mark relevant detail.

e. The use of methods, both physical and digital, to optimise image capture.

f. Recording of the mark(s).

Sub-Activities not required to be included in accreditation scope

g. Consideration of context to determine the activity that caused the deposition.

62.4 Excluded from this FSA but Included in other FSAs

62.4.1 The following do not fall within the definition of ‘Marks: Visualisation and Enhancement’ but are the subject of a different FSA definition.

a. FSA Definition – Marks Comparison (Section 63).

b. FSA Definition – Friction Ridge Detail: Visualisation and Enhancement (Section 57).

c. FSA Definition – Footwear: Coding and Scene Linking (Section 59).

d. FSA Definition – Footwear: Screening (Section 60).

e. FSA Definition – Footwear Mark Comparisons (Section 61).

63. FSA Definition – Marks Comparison

63.1 Definition

63.1.1 The analysis to determine whether or not a mark or a series of marks could have been made by an item or items suspected of making them.

63.1.2 Such marks may be present on any substrate and in any medium, including skin and substrates that allow for three-dimensional representation of the item responsible.

63.1.3 This FSA excludes Friction Ridge Detail (see sections 57, 58) and Footwear marks (see sections 59, 60, 61), and includes other marks (e.g. toolmarks).

63.2 Required Compliance

63.2.1 Compliance with this Code from the effective date of the Code (see 10.1.3).

63.2.2 Accreditation to ISO 17025 [1] from the effective date of the Code (see 10.1.3), for the sub-activities the organisation undertakes which are required to be on the accreditation scope.

63.2.3 Within 24 months of the effective date of the Code (see 10.1.3) the organisation must demonstrate compliance with the Code by having a schedule of accreditation that includes the Code and reflects all FSAs (or parts thereof) that the organisation undertakes.

63.3 Sub-Activities

63.3.1 The following sub-activities are considered to constitute ‘Marks: Comparison’.

Sub-Activities to be included in accreditation scope

a. The macroscopic or microscopic comparison of two or more marks, from one or more scenes, to determine whether or not they could have been made by the same item, including screening exercises.

b. The macroscopic or magnified examination and/or analysis of a mark, or marks, to determine what may have caused it, either generically or specifically, where appropriate with reference to database material.

c. The operation/interrogation of a database referred to in clause (b) (see 31).

d. The macroscopic or magnified comparison of a mark or marks, howsoever made, with an item suspected of making it/them, including screening exercises, to determine areas of agreement and difference.

e. The recording, including the creation of a cast, of any mark.

f. Recovery of erased marks.

g. The production of test impressions from an item, or items, suspected of having made, or contributed to, a mark.

h. Interpretation of the source of the mark.

Sub-Activities not required to be included in accreditation scope

i. The macroscopic or magnified examination and/or analysis of a mark (or image of a mark) to determine an activity that may have led to the production of that mark.

j. Any of the above sub-activities when performed on marks on skin.

63.4 Excluded from this FSA but Included in other FSAs

63.4.1 The following do not fall within the definition of ‘Marks: Comparison’ but are the subject of a different FSA definition.

a. FSA Definition – Marks Visualisation and Enhancement(Section 62).

b. FSA Definition – Incident Scene Examination (Section 46).

c. FSA Definition – Firearms: Ballistics (Section 72).

d. FSA Definition – Examination and Classification of Firearms, Ammunition, and Associated Materials (Section 71).

e. FSA Definition – Footwear Mark Comparisons (Section 61).

f. FSA Definition – Friction Ridge Detail: Visualisation and Enhancement (Section 57).

g. FSA Definition – Friction Ridge Detail: Comparison (Section 58).

h. FSA Definition – Damage and Physical Fit (Section 64).

i. FSA Definition – Human DNA Analysis (Section 50) and FSA Definition – Analysis to Identify and Quantify Drugs and/or Associated Materials (Section 56) (i.e. Any chemical or biological analysis of the material comprising or found within the mark(s)).

63.5 Exclusions from this FSA and the Code

63.5.1 The following do not fall within the definition of ‘Marks: Comparison’ and will not fall under the Code.

a. The examination of penetrating wounds.

b. The examination of bite marks.

64. FSA Definition – Damage and Physical Fit

64.1 Definition

64.1.1 Analysis to determine the cause of damage sustained and/or the reconstruction of part/whole item from two or more parts, to link implements/individuals to

incidents and/or provide information as to the type of implement involved in an incident.

64.2 Required Compliance

64.2.1 Compliance with this Code from the effective date of the Code (see 10.1.3).

64.2.2 Accreditation to ISO 17025 [1] from the effective date of the Code (see 10.1.3), for the sub-activities the organisation undertakes which are required to be on the accreditation scope.

64.2.3 Within 24 months of the effective date of the Code (see 10.1.3) the organisation must demonstrate compliance with the Code by having a schedule of accreditation that includes the Code and reflects all FSAs (or parts thereof) that the organisation undertakes.

64.3 Sub-Activities

64.3.1 The following sub-activities are considered to constitute ‘Damage and Physical Fit’.

Sub-Activities to be included in accreditation scope

a. Macroscopic examination of items and/or component parts, noting general condition, damage, and any associated staining.

i. The sample types that may be assessed include any type of physical material that is susceptible to damage and/or that can be broken.

ii. The sample may be given as separate exhibits or searched for (for example stab cuts in fabric).

b. Microscopical examination to identify and document detailed physical features that characterise the nature of damage.

c. Recording and comparison of fracture surfaces, if applicable.

d. Comparison between damage and implements alleged to cause the damage, to determine whether the damage could have been caused by a particular implement.

e. Comparison with control damage features produced with a considered implement.

f. Comparison between two or more items that may once have been part of one item, and assessment of evidential value of fit.

g. Comparison of component parts to determine common source if conclusive fit cannot be established.

Sub-Activities not required to be included in accreditation scope

h. Consideration of how (including using reconstruction simulations) and when damage was caused.

64.4 Note

64.4.1 Examination and analysis of damage caused by corrosive substances is covered under this section (see FSA Definition – Analysis of Corrosives and/or Noxious Substances).

64.4.2 Examination and analysis of thermal damage (e.g. from flash burning) is covered under this section (see FSA Definition – Examination of Fire Scenes).

64.4.3 If simulations are conducted, this may enable targeting of specific areas on the item for “touch” DNA (see FSA Definition – Human DNA Analysis).

64.5 Excluded from this FSA but Included in other FSAs

64.5.1 The following do not fall within the definition of ‘Damage and Physical Fit’ but are the subject of a different FSA definition.

a. FSA Definition – Examination and Analysis of Particulate Trace Materials (Section 69).

b. FSA Definition – Firearms: Ballistics (Section 72).

c. FSA Definition – Marks Comparison (Section 63).

d. FSA Definition – Footwear: Screening (Section 60).

e. FSA Definition – Footwear Mark Comparisons (Section 61).

f. FSA Definition – Examination of Incidents Involving Vehicles (Section 84).

g. FSA Definition – Examination and Analysis of Vehicle Components (Section 73).

65. FSA Definition – Taggant Analysis

65.1 Definition

65.1.1 The analysis to determine the presence of known reference taggants used to mark items of property, assets, or offenders during a criminal offence, and comparison with taggants from known deployment or a database to determine where the taggant was deployed.

65.2 Required Compliance

65.2.1 Compliance with this Code from the effective date of the Code (see 10.1.3).

65.2.2 Accreditation to ISO 17025 [1] from the effective date of the Code (see 10.1.3), for the sub-activities the organisation undertakes which are required to be on the accreditation scope.

65.2.3 Within 24 months of the effective date of the Code (see 10.1.3) the organisation must demonstrate compliance with the Code by having a schedule of accreditation that includes the Code and reflects all FSAs (or parts thereof) that the organisation undertakes.

65.3 Sub-Activities

65.3.1 The following sub-activities are considered to constitute ‘Taggant Analysis’.

Sub-Activities to be included in accreditation scope

a. Examination of the taggant.

b. Analysis of the taggant.

c. Comparison of results against a searchable reference database (see 31).

65.4 Exclusions from this FSA and the Code

65.4.1 The following do not fall within the definition of ‘Taggant Analysis’ and will not fall under the Code.

a. Manufacture of taggants and performance to defined standards. However, practitioners should be aware of the robustness and limitations of taggants through the use of relevant standards.

66. FSA Definition – Analysis of Corrosives and/or Noxious Substances

66.1 Definition

66.1.1 Analysis of material suspected and/or believed to be noxious, including a lachrymator, and/or corrosive used in alleged attacks.

66.2 Required Compliance

66.2.1 Compliance with this Code from the effective date of the Code (see 10.1.3).

66.2.2 Accreditation to ISO 17025 [1] from the effective date of the Code (see 10.1.3), for the sub-activities the organisation undertakes which are required to be on the accreditation scope.

66.2.3 Within 24 months of the effective date of the Code (see 10.1.3) the organisation must demonstrate compliance with the Code by having a schedule of accreditation that includes the Code and reflects all FSAs (or parts thereof) that the organisation undertakes.

66.3 Sub-Activities

66.3.1 The following sub-activities are considered to constitute ‘Analysis of Corrosive and/or Noxious Substances’.

Sub-Activities to be included in accreditation scope

a. Selecting a portion of the material submitted for analysis.

b. The examination and/or analysis (whether qualitative or quantitative) of any item/exhibit to determine whether it comprises, contains, or is contaminated with any relevant substance.

c. Identification of Corrosive or Noxious Substances including use of reference databases (see 31).

d. Analysis to determine the concentration of a relevant substance, where the nature or the volume of the material submitted permits.

e. The examination and/or analysis of any container holding a suspected corrosive liquid to determine if this can be discharged as a spray or jet.

f. Analysis of pre-cursers (including but not limited to hydrochloric acid and acetone) and poisonous metals (such as mercury) is included within this FSA .

g. The examination and/or analysis of any item/exhibit or matter to determine the degree of similarity of a sample of relevant material to any reference material or sample of known origin.

66.4 Note

a. In this section the term ‘relevant substance’ means anything listed in Schedule 1 of the Offensive Weapons Act 2019 [96], and lachrymators.

66.5 Excluded from this FSA but Included in other FSAs

66.5.1 The following do not fall within the definition of ‘Analysis of Corrosive and/or Noxious Substances’ but are the subject of a different FSA definition.

a. FSA Definition – Toxicology: Analysis for Drug(s), Alcohol, and/or Noxious Substances (Section 53).

b. FSA Definition – Examination and Analysis of Hazardous Chemical and Biological Agents and Associated Materials (Section 74).

67. FSA Definition – Analysis of Residues of Lubricants used in Sexual Offences, Including Oils, Greases, and Lubricants

67.1 Definition

67.1.1 Examination and Analysis of substances used as lubricants in sexual offences, and evaluation of the observations in the context of the alleged circumstances or to inform lines of inquiry.

67.2 Required Compliance

67.2.1 Compliance with this Code from the effective date of the Code (see 10.1.3).

67.2.2 Accreditation to ISO 17025 [1] from the effective date of the Code (see 10.1.3), for the sub-activities the organisation undertakes which are required to be on the accreditation scope.

67.2.3 Within 24 months of the effective date of the Code (see 10.1.3) the organisation must demonstrate compliance with the Code by having a schedule of accreditation that includes the Code and reflects all FSAs (or parts thereof) that the organisation undertakes.

67.3 Sub-Activities

67.3.1 The following sub-activities are considered to constitute ‘Analysis of Residues of Lubricants used in Sexual Offences, Including Oils, Greases, and Lubricants’.

Sub-Activities to be included in accreditation scope

a. Visual examination, including microscopy, for the purpose of locating relevant material and residues of relevant material, and comparisons using lighting techniques.

b. Recovery of relevant material and residues of relevant material.

i. Extraction methods for polar and non-polar lubricants (aqueous and organic) are included.

ii. Solvent extraction of previously prepared extracts (body fluid/DNA).

c. Speculative extraction of swabs and targeted areas of items to detect and identify latent residues through chemical analysis, supported by extraction and analysis of appropriate control samples.

d. Identification of the lubricant including use of reference databases (see 31).

e. Comparison of any relevant material and/or residues of relevant material detected with a suspected source from reference items.

67.4 Note

a. In this FSA, relevant material refers to oils, greases, and lubricants. Some of the materials identified will be genuine lubricants, but others may not be recognised as such.

67.5 Excluded from this FSA but Included in other FSAs

67.5.1 The following do not fall within the definition of ‘Analysis of Residues of Lubricants used in Sexual Offences, Including Oils, Greases, and Lubricants’ but are the subject of a different FSA definition.

a. FSA Definition – Incident Scene Examination (Section 46).

b. FSA Definition – Forensic Examination of Sexual Offence Complainants (Section 47).

c. FSA Definition – Forensic Examination of Detainees (Section 87).

d. FSA Definition – Human DNA Analysis (Section 50).

e. FSA Definition – Human Biological Material Examination (Section 48).

67.6 Exclusions from this FSA and the Code

67.6.1 The following do not fall within the definition of ‘Analysis of Residues of Lubricants used in Sexual Offences, Including Oils, Greases, and Lubricants’ and will not fall under the Code.

a. Provision of opinions relating to absorption or interpretations of what may be remaining after application to human skin.

68. FSA Definition – Analysis of Ignitable Liquids and their Residues

68.1 Definition

68.1.1 Examination and analysis of ignitable liquids and their associated residues from samples, including fire debris samples and clothing of individuals believed to have been handling ignitable liquids, and materials impregnated with ignitable liquids or their residues.

68.1.2 In this section, the sub-activities may apply to mixtures of ignitable liquids with each other or with other substances (e.g. engine oil).

68.1.3 The following sub-activities are considered to constitute ‘Analysis of Ignitable Liquids and their Residues’.

68.2 Required Compliance

68.2.1 Compliance with this Code from the effective date of the Code (see 10.1.3).

68.2.2 Accreditation to ISO 17025 [1] from the effective date of the Code (see 10.1.3), for the sub-activities the organisation undertakes which are required to be on the accreditation scope.

68.2.3 Within 24 months of the effective date of the Code (see 10.1.3) the organisation must demonstrate compliance with the Code by having a schedule of accreditation that includes the Code and reflects all FSAs (or parts thereof) that the organisation undertakes.

68.3 Sub-Activities

68.3.1 The following sub-activities are considered to constitute ‘Analysis of Ignitable Liquids and their Residues’.

Sub-Activities to be included in accreditation scope

a. Examination to include recovery and extraction.

b. Analysis of ignitable liquids or their residues.

c. Identification of the ignitable liquid/residue including the use of reference databases (see 31).

d. Comparison of ignitable liquids/ignitable liquid residues recovered from fire debris or other material against reference standards and/or reference samples collected from a location of interest.

Sub-Activities not required to be included in accreditation scope

e. Examination and/or analysis of materials with a view to establishing their explosive effect in relation to being considered a petrol bomb which is classed as an ‘explosive substance’ under the Section 3(b) of the Explosive Substances Act 1883 [97].

68.4 Excluded from this FSA but Included in other FSAs

68.4.1 The following do not fall within the definition of ‘Analysis of Ignitable Liquids and their Residues’ but are the subject of a different FSA definition.

a. FSA Definition – Incident Scene Examination (Section 46).

b. FSA Definition – Examination of Fire Scenes (Section 85).

c. FSA Definition – Examination and Analysis of Explosives, Explosives Precursors, and Explosive Residues (Section 75).

68.5 Exclusions from this FSA and the Code

68.5.1 The following do not fall within the definition of ‘Analysis of Ignitable Liquids and their Residues’ and will not fall under the Code.

a. Flammability assessment.

b. Interpretation of use in relation to fire investigation, including (but not limited to) assessment of potential harm.

c. Examination and analysis of gases (such as Methane, Ethane, Propane, Butane, or Hydrogen).

69. FSA Definition – Examination and Analysis of Particulate Trace Materials

69.1 Definition

69.1.1 The examination and analysis of particulate trace materials that could be transferred as a result of contact.

69.2 Required Compliance

69.2.1 Compliance with this Code from the effective date of the Code (see 10.1.3).

69.2.2 Accreditation to ISO 17025 [1] from the effective date of the Code (see 10.1.3), for the sub-activities the organisation undertakes which are required to be on the accreditation scope.

69.2.3 Within 24 months of the effective date of the Code (see 10.1.3) the organisation must demonstrate compliance with the Code by having a schedule of accreditation that includes the Code and reflects all FSAs (or parts thereof) that the organisation undertakes.

69.3 Sub-Activities

69.3.1 The following sub-activities are considered to constitute ‘Examination and Analysis of Particulate Trace Materials’.

Sub-Activities to be included in accreditation scope

a. The examination of an item/exhibit to locate relevant material (including with microscopy).

b. The preservation, recovery, and/or recording of relevant material from an item using such methods as are deemed appropriate for the material under consideration.

c. The examination and/or analysis of recovered relevant material and its comparison with a control sample, using such visual/microscopic, physical, and analytical techniques as are deemed appropriate.

d. The identification including the use of reference databases (see 31).

e. The examination and/or analysis of relevant material in relation to any of the following:

i. the potential source of relevant material;

ii. the originating source of the relevant material, and/or information regarding manufacture/manufacturer;

Sub-Activities not required to be included in accreditation scope

f. Consideration of any of the following:

i. the distribution methods or extent or distribution of the relevant material or the source from which it originated;

ii. where and/or when material was acquired; and/or

iii. an activity that may have led to the transfer of the relevant material(s).

69.4 Note

69.4.1 Particulate trace material may by its presence indicate:

a. contemporaneous proximity of an individual or item to relevant locations.

b. participation in a given activity relevant to the incident under investigation.

69.4.2 In this section ‘relevant material’ may include:

a. Glass.

b. Surface coatings, polymers, and adhesives.

c. Synthetic and natural fibres.

d. Ceramics, fibreglass, asbestos, lead, and other building material not contained within clauses (a) to (c).

e. Generated particulate material not contained within clauses (a) to (d).

69.5 Excluded from this FSA but Included in other FSAs

69.5.1 The following do not fall within the definition of ‘Examination and Analysis of Particulate Trace Materials’ but may be in a different FSA definition.

a. Examination of Persons (See sections 47, 87, and 88).

b. FSA Definition – Human Biological Material Examination (Section 48).

c. FSA Definition – Non-Human Biological Examination: Plants, Microbes, and Invertebrates (Section 89).

d. FSA Definition – Analysis to Identify and Quantify Drugs and/or Associated Materials (Section 56).

e. FSA Definition – Taggant Analysis (Section 65).

f. FSA Definition – Analysis of Corrosives and/or Noxious Substances (Section 66).

g. FSA Definition – Analysis of Residues of Lubricants used in Sexual Offences, Including Oils, Greases, and Lubricants (Section 67).

h. FSA Definition – Examination and Analysis of Gunshot Residue (Section 70).

i. FSA Definition – Examination and Analysis of Explosives, Explosives Precursors, and Explosive Residues (Section 75).

70. FSA Definition – Examination and Analysis of Gunshot Residue (GSR)

70.1 Definition

70.1.1 The examination and analysis of items/exhibits recovered from any item to determine whether or not GSR is present.

70.2 Required Compliance

70.2.1 Compliance with this Code from the effective date of the Code (see 10.1.3).

70.2.2 Accreditation to ISO 17025 [1] from the effective date of the Code (see 10.1.3), for the sub-activities the organisation undertakes which are required to be on the accreditation scope.

70.2.3 Within 24 months of the effective date of the Code (see 10.1.3) the organisation must demonstrate compliance with the Code by having a schedule of accreditation that includes the Code and reflects all FSAs (or parts thereof) that the organisation undertakes.

70.3 Sub-Activities

70.3.1 The following sub-activities are considered to constitute ‘Examination and Analysis of Gunshot Residue (GSR)’.

Sub-Activities to be included in accreditation scope

a. The examination of an item/exhibit to recover particulate residues and propellant (if applicable) referred to as GSR produced from the discharge of primed ammunition in a firearm. The residue can contain addition contributions from the firearm, cartridge case, and projectile.

b. The presumptive testing for the presence of metals, particularly lead and copper.

c. The analysis of any recovered samples, such as adhesive lifts (e.g. stubs) or swabs, to determine:

i. whether it has GSR on it;

ii. the amount and distribution of GSR recovered from an examined item; and/or

iii. whether or not there are particles on the sample that indicate material from a non-firearm source (e.g. fireworks or vehicle airbags) is present which might detract from the classification of other particles on that sample as having originated from a firearm source.

d. Analysis to determine the elemental composition of the GSR particles to provide information on the primer, projectile, and potentially other ammunition and gun components.

e. The comparison of GSR on an item/exhibit from a control sample, such as a swab taken from the muzzle of a firearm, or the interior of a spent cartridge case, or samples taken from a victim, to GSR identified on samples from examined items.

70.4 Excluded from this FSA but Included in other FSAs

70.4.1 The following do not fall within the definition of ‘Examination and Analysis of Gunshot Residue (GSR)’ but are the subject of a different FSA definition.

a. FSA Definition – Incident Scene Examination (Section 46).

b. FSA Definition – Examination and Classification of Firearms, Ammunition, and Associated Materials (Section 71).

c. FSA Definition – Firearms: Ballistics (Section 72).

d. FSA Definition – Examination and Analysis of Explosives, Explosives Precursors, and Explosive Residues (Section 75).

e. Examination of Persons (See sections 47, 87, 88).

71. FSA Definition – Examination and Classification of Firearms, Ammunition, and Associated Materials

71.1 Definition

71.1.1 Examination of an item/exhibit suspected of being a firearm, ammunition, or component part of a firearm or ammunition, to determine its classification under the provisions of the Firearms Act 1968 [98], and the capability of the firearm, ammunition, and/or associated materials.

71.2 Required Compliance

71.2.1 Compliance with this Code from the effective date of the Code (see 10.1.3).

71.2.2 Accreditation to ISO 17025 [1] from the effective date of the Code (see 10.1.3), for the sub-activities the organisation undertakes which are required to be on the accreditation scope.

71.2.3 Within 24 months of the effective date of the Code (see 10.1.3) the organisation must demonstrate compliance with the Code by having a schedule of accreditation that includes the Code and reflects all FSAs (or parts thereof) that the organisation undertakes.

71.3 Sub-Activities

71.3.1 The following sub-activities are considered to constitute ‘Examination and Classification of Firearms, Ammunition, and Associated Materials’.

Sub-Activities to be included in accreditation scope

a. Any preliminary classification for the purpose of a charging decision.

i. Consideration of compliance with definitions of ‘component parts’, ‘firearm’ and ‘readily convertible firearm’ under the Firearms Act 1968 [98].

ii. The measurement of firearm dimensions to determine their classification under the provisions of the Firearms Act 1968 [98].

iii. The dismantling and testing of ammunition to determine their classification under the provisions of the Firearms Act 1968 [98].

b. The examination of recovered firearms to identify type and origin, via markers such as manufacturer, model, serial number, and calibre.

c. Any analysis, including test firing, to determine viability and functionality of a firearm or ammunition.

d. Analysis to determine kinetic energy of a projectile fired from a suspected firearm.

e. Analysis to determine the trigger-pull pressure required to discharge a weapon.

f. Examination of the mechanical condition of the weapon to assess potential causes of the discharge and determine whether it was unintentional.

g. The examination and/or analysis of any container holding a suspected lachrymator to determine if this can be considered a firearm under Section 5 of the Firearms Act 1968 [98].

Sub-Activities not required to be included in accreditation scope

h. The test firing of a firearm to determine firing distance and weapon accuracy.

i. Examination of the sighting equipment on a firearm to assess an allegation of unintentional shooting of a victim.

71.4 Note

71.4.1 In this section the term firearm means any object which is subject to the controls of the Firearms Act 1968 [98].

71.4.2 In this section the term associated materials includes items related to firearms, including sound moderators, magazines, ammunition re-loading tools, and firearm conversion tools and components.

71.5 Excluded from this FSA but Included in other FSAs

71.5.1 The following do not fall within the definition of 'Examination and Classification of Firearms, Ammunition, and Associated Materials', but are the subject of a different FSA definition.

a. FSA Definition – Incident Scene Examination (Section 46).

b. FSA Definition – Analysis of Corrosives and/or Noxious Substances (Section 66).

c. FSA Definition – Examination and Analysis of Gunshot Residue (Section 70).

d. FSA Definition – Firearms: Ballistics (Section 72).

72. FSA Definition – Firearms: Ballistics

72.1 Definition

72.1.1 The examination and/or analysis of any mark characteristics on cycled ammunition, components, or related fired ballistic material.

72.2 Required Compliance

72.2.1 Compliance with this Code from the effective date of the Code (see 10.1.3).

72.2.2 Accreditation to ISO 17025 [1] from the effective date of the Code (see 10.1.3), for the sub-activities the organisation undertakes which are required to be on the accreditation scope.

72.2.3 Within 24 months of the effective date of the Code (see 10.1.3) the organisation must demonstrate compliance with the Code by having a schedule of accreditation that includes the Code and reflects all FSAs (or parts thereof) that the organisation undertakes.

72.3 Sub-Activities

72.3.1 The following sub-activities are considered to constitute ‘Firearms: Ballistics’.

Sub-Activities to be included in accreditation scope

a. Examination using macroscopic techniques to assess whether or not the characteristics on fired, cycled ammunition, or related fired ballistic material can be associated with a weapon class.

b. Examination and/or analysis using microscopic techniques to assess whether or not the characteristics on fired, cycled ammunition, or related fired ballistic material can be associated with a weapon.

c. Linking any cycled ammunition, components, or related fired ballistic material to an incident scene.

d. Linking cycled ammunition, components, or related fired ballistic material to a recovered firearm.

e. The use of any database systems that record and/or compare features of cycled ammunition, components of related fired ballistic material to establish links between incidents.

f. Test firing of firearms to generate ammunition mark samples for the use in database systems.

g. Ballistics calculations including trajectories and maximum ranges.

h. Examination, analysis, and interpretation of damage caused, or believed to have been caused, by the discharge of a firearm.

72.4 Note

72.4.1 In this section the term firearm means any object which is subject to the controls of the Firearms Act 1968 [98].

72.5 Excluded from this FSA but Included in other FSAs

72.5.1 The following do not fall within the definition of ‘Firearms: Ballistics’ but are the subject of a different FSA definition.

a. FSA Definition – Incident Scene Examination (Section 46).

b. Examination of Persons (see sections 47, 87, 88).

c. FSA Definition – Analysis of Corrosives and/or Noxious Substances (Section 66).

d. FSA Definition – Examination and Analysis of Gunshot Residue (Section 70).

e. FSA Definition – Examination and Classification of Firearms, Ammunition, and Associated Materials (Section 71).

f. FSA Definition – Control and Management of a Forensic Database (Section 97).

73. FSA Definition – Examination and Analysis of Vehicle Components

73.1 Definition

73.1.1 Examination and/or analysis of the condition of vehicle components to determine if their failure could have contributed to an incident. This includes assessment of mechanical and electrical components, including electrical software and telematic systems.

73.2 Required Compliance

73.2.1 Compliance with this Code from the effective date of the Code (see 10.1.3).

73.2.2 Accreditation to ISO 17025 [1] from the effective date of the Code (see 10.1.3), for the sub-activities the organisation undertakes which are required to be on the accreditation scope.

73.2.3 Within 24 months of the effective date of the Code (see 10.1.3) the organisation must demonstrate compliance with the Code by having a schedule of accreditation that includes the Code and reflects all FSAs (or parts thereof) that the organisation undertakes.

73.3 Sub-Activities

73.3.1 The following sub-activities are considered to constitute 'Examination and Analysis of Vehicle Components'.

Sub-Activities to be included in accreditation scope

a. Any specialist requirements for receipt within a forensic unit of a vehicle and/or vehicle component which has been involved in an incident.

b. Any examination(s) of, or analysis carried out on, a component of a vehicle involved in a collision to determine that component's failure mode.

Sub-Activities not required to be included in accreditation scope

c. Any interpretation of the observations from the examination(s) and/or analysis, in the context of competing hypotheses, to address the specific issues in question.

73.4 Note

73.4.1 A 'component' of a vehicle includes those which function in effective isolation (e.g. tyres), or which function as part of a multi-component system (e.g. lights).

73.5 Excluded from this FSA but Included in other FSAs

73.5.1 The following do not fall within the definition of 'Examination and Analysis of Vehicle Components' but are the subject of a different FSA definition.

a. FSA Definition – Incident Scene Examination (Section 46).

b. FSA Definition – Examination of Incidents Involving Vehicles (Section 84).

c. FSA Definition – Damage and Physical Fit (Section 64).

d. FSA Definition – Data Capture and Processing from Digital Storage Devices (Section 76).

74. FSA Definition – Examination and Analysis of Hazardous Chemical and Biological Agents and Associated Materials

74.1 Definition

74.1.1 The examination and analysis of hazardous chemical and biological agents and associated materials.

74.2 Required Compliance

74.2.1 Compliance with this Code from the effective date of the Code (see 10.1.3).

74.2.2 Accreditation to ISO 17025 [1] from the effective date of the Code (see 10.1.3), for the sub-activities the organisation undertakes which are required to be on the accreditation scope.

74.2.3 Within 24 months of the effective date of the Code (see 10.1.3) the organisation must demonstrate compliance with the Code by having a schedule of accreditation that includes the Code and reflects all FSAs (or parts thereof) that the organisation undertakes.

74.3 Sub-Activities

74.3.1 The following sub-activities are considered to constitute ‘Examination and Analysis of Hazardous Chemical and Biological Agents and Associated Materials’.

Sub-Activities to be included in accreditation scope

a. The examination and/or analysis of any item/exhibit to determine whether relevant material is present.

b. The recovery of any relevant material or item of the descriptions below:

   i. an item comprised of relevant material; and/or

   ii. an item which has relevant material in or on it.

c. The examination and/or analysis of any item/exhibit or matter to determine the identity and nature of relevant material present.

d. Agent Identification including use of reference databases (see 31).

e. The examination and/or analysis of any item/exhibit or matter to determine any of the following:

i. the potential immediate source (e.g. device or dissemination mechanism) of relevant material;

ii. the degree of similarity of separate samples of relevant material; and/or

iii. the degree of similarity of a sample of relevant material to any reference material or sample of known origin.

74.4 Note

74.4.1 In this section relevant material means any of the following.

a. A chemical or biological agent produced or held in circumstances where the possession amounts to a criminal offence.

b. A chemical or biological agent which is being produced or held with the intention that it may be used for, or to facilitate, the commission of a criminal offence.

c. Any chemical or biological agent which is being produced or used for, or to facilitate, the commission of a criminal offence.

d. Any chemical or biological agent which has contaminated any person or location as the result of a criminal offence or attempt to commit an offence.

e. Any precursor chemical or material, or breakdown products relevant to any hazardous chemical or biological material.

74.4.2 The nature of the substance as a chemical or biological agent must be a significant factor in the nature of the criminal offence referred to above.

74.4.3 The definition of the criminal offence need not refer to chemical or biological agents.

74.4.4 The term chemical agent means a chemical weapon as defined in s1 Chemical Weapons Act 1996 [99].

74.4.5 The term biological agent means any biological agent, toxin or weapon or genetically modified forms of any of the above subject to the provisions of the Biological Weapons Act 1974 [100].

74.4.6 Any reference to a chemical or biological agent shall be taken to include any material produced by or from the agent.

74.5 Excluded from this FSA but Included in other FSAs

74.5.1 The following do not fall within the definition of ‘Examination and Analysis of hazardous chemical and biological agents and associated materials’ but are the subject of a different FSA definition.

a. FSA Definition – Analysis of Corrosives and/or Noxious Substances (Section 66).

b. FSA Definition – Toxicology: Analysis for Drug(s), Alcohol, and/or Noxious Substances (Section 53).

c. FSA Definition – Examination and Analysis of Radioactive Material (Section 92).

74.6 Exclusions from this FSA and the Code

74.6.1 The following do not fall within the definition of ‘Examination and Analysis of Hazardous Chemical and Biological Agents and Associated Materials’ and will not fall under the Code.

a. Clinical or diagnostic testing.

b. Consideration of the potential method of production and/or the geographical origin (i.e. national geographical location or production facility) of any relevant material.

75. FSA Definition – Examination and Analysis of Explosives, Explosives Precursors, and Explosive Residues

75.1 Definition

75.1.1 Examination and analysis of material suspected to be an explosive substance, explosives precursor or explosives residue.

75.2 Required Compliance

75.2.1 Compliance with this Code from the effective date of the Code (see 10.1.3).

75.2.2 Accreditation to ISO 17025 [1] from the effective date of the Code (see 10.1.3), for the sub-activities the organisation undertakes which are required to be on the accreditation scope.

75.2.3 Within 24 months of the effective date of the Code (see 10.1.3) the organisation must demonstrate compliance with the Code by having a schedule of accreditation that includes the Code and reflects all FSAs (or parts thereof) that the organisation undertakes.

75.3 Sub-Activities

75.3.1 The following sub-activities are considered to constitute ‘Examination and Analysis of Explosives, Explosives Precursors, and Explosives Residues’.

Sub-Activities to be included in accreditation scope

a. The recovery from any item/exhibit of any relevant material or item of the descriptions below:

i. an item/exhibit comprised of relevant material; and/or

ii. an item/exhibit which has relevant material in or on it.

b. The examination and/or analysis of any item/exhibit to determine the presence and nature of any relevant material. This includes trace and bulk explosives analysis.

c. Explosive material identification including use of reference databases (see 31).

d. The examination and/or analysis of any item/exhibit to determine any of the following:

i. the potential sources of relevant material; and/or

ii. the degree of similarity of individual samples of relevant material, and/or a sample of relevant material to any reference material or sample of known origin.

e. The examination and/or analysis, of any item/exhibit to determine whether they (or anything produced from them) are capable of producing a viable explosive substance.

Sub-Activities not required to be included in accreditation scope

f. The examination and/or analysis of any item or matter to determine any of the following:

i. the potential explosives significance of chemical precursors; and/or

ii. the cause and/or circumstances of an explosion.

g. Consideration of whether explosive substances may be produced from any materials, including in cases where no such materials have been recovered (e.g. from a methodology in a written publication or other form of media, such as video).

75.4 Note

75.4.1 In this section relevant material means any of the following.

a. An explosive substance or explosives precursor held in circumstances where the possession amounts to a criminal offence.

b. An explosives residue that has been recovered from any person, item or location as the result of a criminal offence or attempt to commit an offence.

75.4.2 The term ‘explosive substance’ shall cover any substance which would be subject to the provisions of the Explosives Act 1875 [101], the Explosive Substances Act 1883 [97], or the Explosives Regulations 2014 [102].

75.5 Excluded from this FSA but Included in other FSAs

75.5.1 The following do not fall within the definition of ‘Examination and Analysis of Explosives, Explosives Precursors, and Explosives Residues’ but are the subject of a different FSA definition.

a. FSA Definition – Examination and Analysis of Suspected Explosive Devices (Section 93).

b. FSA Definition – Examination and Analysis of Gunshot Residue (Section 70).

c. FSA Definition – Examination and Classification of Firearms, Ammunition, and Associated Materials (Section 71).

d. FSA Definition – Analysis of Ignitable Liquids and their Residues (Section 68).

75.6 Exclusions from this FSA and the Code

75.6.1 The following do not fall within the definition of ‘Examination and Analysis of Explosives, Explosives Precursors, and Explosives Residues’ and will not fall under the Code.

a. Screening of items/persons/locations for explosives residue, including the screening of people at an airport or other transport hub.

b. Interpretation of screening observations, for example from airport samples.

76. FSA Definition – Data Capture and Processing from Digital Storage Devices

76.1 Definition

76.1.1 Screening of a digital storage media for a decision on seizure or prioritisation (e.g. using a triage software tool), capture, and processing of data from digital storage media. Digital storage media comprising both standalone storage devices, components, cloud storage as well as volatile and non-volatile memory embedded within electronic computing devices, including at scenes of incident.

76.2 Required Compliance

76.2.1 Compliance with this Code, including section 104 - Digital Forensics, from the effective date of the Code (see 10.1.3).

76.2.2 Accreditation to ISO 17025 [1] from the effective date of the Code (see 10.1.3), for the sub-activities the organisation undertakes which are required to be on the accreditation scope.

76.2.3 Within 24 months of the effective date of the Code (see 10.1.3) the organisation must demonstrate compliance with the Code by having a schedule of accreditation that includes the Code and reflects all FSAs (or parts thereof) that the organisation undertakes.

76.3 Sub-Activities

76.3.1 The following sub-activities are considered to constitute ‘Data Capture and Processing from Digital Storage Devices’.

Sub-Activities to be included in accreditation scope

76.3.2 Any of the following performed on any storage device under examination which includes but is not limited to phones and the imaging of drives.

a. Screening devices for seizure/prioritisation, or recovery of data from a device under examination using an off-the-shelf tool for factual reporting.

b. The examination of a device, media, or component to locate or capture and preserve (create a copy of the digital data in whole or in part and store the copy in a manner that allows subsequent processing and analysis to take place) any information stored on or accessible via the device in digital/electronic format (i.e. cloud storage).

c. Processing - conversion of digital data to produce meaningful information, either by a manual or automated process, to allow for subsequent analysis and/or reporting to take place, including:

i. Reverse-engineering undocumented data structures.

ii. The manual manipulation of data from an embedded database file (e.g. SQLite, LevelDB) into a human readable format.

76.4 Excluded from this FSA but Included in other FSAs

76.4.1 The following do not fall within the definition of ‘Data Capture and Processing from Digital Storage Devices’ but are the subject of another FSA definition.

a. FSA Definition – Recovery and Processing of Footage from CCTV/VSS (Section 79).

b. FSA Definition – Specialist Video Multimedia, Recovery, Processing and Analysis (Section 80).

c. FSA Definition – Technical Audio Operations (Section 81).

d. FSA Definition – Geolocation Analysis (Section 78).

e. FSA Definition – Examination of Incidents Involving Vehicles (Section 84).

f. FSA Definition – Incident Scene Examination (Section 46).

76.5 Exclusions from this FSA and the Code

76.5.1 The following do not fall within the definition of ‘Data Capture and Processing from Digital Storage Devices’ and will not fall under the Code.

a. Screening of media for the purpose of offender management, i.e. post sentencing monitoring under a supervision order.

b. The manual classification of indecent images of children.

c. Recording and transfer of 999 calls using a controlled system.

d. Recording and transfer of police interviews using a controlled system.

e. Upload and download of audio-visual media from digital asset management systems.

77. FSA Definition – Digital Data Analysis

77.1 Definition

77.1.1 The process of targeting digital data via the application of a predefined and prescriptive examination strategy (whether providing intelligence or factual or opinion-based reporting).

77.2 Required Compliance

77.2.1 Compliance with this Code, including section 104 - Digital Forensics, from the effective date of the Code (see 10.1.3).

77.2.2 Accreditation to ISO 17025 [1] from the effective date of the Code (see 10.1.3), for the sub-activities the organisation undertakes which are required to be on the accreditation scope.

77.2.3 Within 24 months of the effective date of the Code (see 10.1.3) the organisation must demonstrate compliance with the Code by having a schedule of accreditation that includes the Code and reflects all FSAs (or parts thereof) that the organisation undertakes.

77.3 Sub-Activities

77.3.1 The following sub-activities conducted for the purpose of providing advice, intelligence, or evidence, are considered to constitute ‘Digital Data Analysis’.

Sub-Activities to be included in accreditation scope

a. Analysis of data created by a user (e.g. suspect, victim, witness) on a digital phone/tablet/computer device (e.g. word processing, spreadsheet, image, video or audio) or from third party source (e.g. cloud service provider, social media company).

b. Analysis of information related to communications (e.g. calls, e-mails, text, social media) including the content of the communication and any data relating to the communication.

c. Analysis of information related to Internet use.

d. Analysis of records related to the location of the device.

e. Analysis to provide information related to activities carried out on or by the computer system (e.g. operating system logs, configuration files, file system metadata, file metadata).

f. Analysis of data from an embedded database (including SQLite searches, Plist tool searches).

77.3.2 The interpretation of any data or output of sub-activity described in clause ‘a-f’ with the purpose of providing opinion to include, but not limited to:

i. the provenance or integrity of files/data. User activity (e.g. file creation, patterns of use);

ii. the reliability / accuracy of data (e.g. recovered timestamps/GPS locations);

iii. the effect of any virus or malware presence; and/or

iv. whether steps had been taken to conceal data (e.g. file manipulation).

77.4 Excluded from this FSA but Included in other FSAs

77.4.1 The following do not fall within the definition of ‘Digital Data Analysis’ but are the subject of a different FSA definition.

a. FSA Definition – Specialist Video Multimedia, Recovery, Processing and Analysis (Section 80).

b. FSA Definition – Technical Audio Operations (Section 81).

c. FSA Definition – Geolocation Analysis (Section 78).

d. FSA Definition – Examination of Incidents Involving Vehicles (Section 84).

77.5 Exclusions from this FSA and the Code

77.5.1 The following do not fall within the definition of ‘Digital Data Analysis’ and will not fall under the Code.

a. The operation of automatic number plate recognition systems.

b. The operation of an eFit process.

c. The manual/visual classification of indecent images of children.

d. The making of radiological images, in accordance with appropriate clinical guidelines, of a dead body or of material taken at a postmortem examination, and the reporting of such images by clinicians or pathologists with appropriate training and qualifications (FSA Definition – Forensic Examination of Deceased Individuals).

78. FSA Definition – Geolocation Analysis

78.1 Definition

78.1.1 Radio frequency (RF)/Electro-Magnetic (EM) survey, mapping and/or cellsite analysis for geolocation.

78.2 Required Compliance

78.2.1 Compliance with this Code, including section 106 - Geolocation - Cell Site, from the effective date of the Code (see 10.1.3).

78.2.2 Accreditation to ISO 17025 [1] by 24 months of the effective date of the Code (see 10.1.3), for the sub-activities the organisation undertakes which are required to be on the accreditation scope.

78.2.3 Within 24 months of the effective date of the Code (see 10.1.3) the organisation must demonstrate compliance with the Code by having a schedule of accreditation that includes the Code and reflects all FSAs (or parts thereof) that the organisation undertakes.

78.3 Sub-Activities

78.3.1 The following sub-activities are considered to constitute ‘Geolocation Analysis’.

Sub-Activities to be included in accreditation scope

a. Cell Site Analysis to give an opinion on the possible geolocation of a suspect device against an alternate proposition is opinion (i.e. expert) evidence. Cell Site Analysis includes but is not limited to:

i. Radio Frequency (RF)/Electro-Magnetic (EM) Propagation Survey of an area or location guided by case scenario and/or Call Data Records as part of determining geolocation of a digital device;

ii. processing and normalisation of Call Data Records or other network provider data for the purposes of cell site analysis;

iii. mapping of cell sites and/or cell site coverage; and/or

iv. assessment and evaluation of Call Data Records or other network provider data against survey data.

b. The evaluation of the significance of propagation survey and/or network information, using Call Data Records any of the above sub-activities (or products of activities e.g. maps) to determine the geolocation of the suspect device is expert opinion evidence.

78.4 Excluded from this FSA but Included in other FSAs

78.4.1 The following do not fall within the definition of ‘Geolocation Analysis’, but are the subject of a different FSA definition:

a. FSA Definition – Speech and Audio Analysis (Section 95), includes geolocation using Electrical Network Frequency analysis (ENF).

78.5 Exclusions from this FSA and the Code

78.5.1 The following do not fall within the definition of ‘Geolocation Analysis’ and will not fall under the Code.

a. The acquisition of communications data by a Communications Data Investigator - Single Point of Contact (CDI-SPoC) is to be performed in accordance with the Investigatory Powers Act 2016 [103] and related codes of practice but is in itself not a forensic science activity for the purpose of this Code.

79. FSA Definition – Recovery and Processing of Footage from CCTV/VSS

79.1 Definition

79.1.1 The recovery and preservation of still and moving images from digital CCTV and Video Surveillance Systems (VSS) and related digital media/systems using the manufacturer’s intended method for the CCTV/VSS systems.

79.2 Required Compliance

79.2.1 Compliance with the Code (including Video Analysis Appendix) and accreditation to ISO 17025 [ref] is only required if the activity is preparatory work for the FSA ‘Specialist Video Multimedia, Recovery, Processing and Analysis’, or the organisation is not acting in accordance with the NPCC Framework for Video Based Evidence [104].

79.3 Sub-Activities

79.3.1 The following sub-activities are considered to constitute ‘Recovery and Processing of footage from CCTV/VSS’.

Sub-Activities to be included in accreditation scope [173]

79.3.2 The recovery and processing, using methods approved by the SAI, of any part of the content of a video file including.

a. Recovery of footage from digital CCTV/VSS in situ by methods approved by the SAI incorporating the CCTV/VSS system manufacturer's intended method:

i. export video (exporting files using CCTV/VSS system, copying via analogue or digital output); and/or

ii. extraction of removable media intended by the manufacturer to be portable.

b. Recovery of the digital video recorder (DVR) as an item from a working digital CCTV/VSS.

c. Creation of master using methods approved by the SAI.

d. Use of Digital Evidence Management System/Software approved by the SAI for:

i. Uploading where a master is created.

ii. Transfer of data.

iii. Clipping for length.

iv. Redaction if included in the approved method.

e. Processing activities include.

i. Creation and production of stills digital (basic brightness and contrast adjustment to entire image is permitted if included in the approved method).

ii. Conversion of video files for viewing or presentation purposes, where a master is created.

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173 Compliance with the Code and accreditation to ISO/IEC 17025 is only required if the activity is preparatory work for the FSA 'Specialist Video Multimedia, Recovery, Processing and Analysis', or the organisation is not acting in accordance with the NPCC Framework for Video Based Evidence.

iii. Clipping of incident footage to shorten the length if included in the SAI approved method.

iv. Removing/redacting audio from footage if included in the SAI approved method.

79.4 Note

79.4.1 Any processing sub-activities listed in 79.3.2e should be included in a forensic units' accreditation to ISO/IEC 17025 [1] if the forensic unit is intending to use the output for further forensic science activities such as FSA Definition – Specialist Video Multimedia, Recovery, Processing and Analysis.

79.4.2 However where recovery and presentation of the footage as a clip or still is the expected end of the process, the forensic unit is using methods approved by the SAI and adhires to the NPCC Framework for Video Based Evidence [104], then accreditation to ISO/IEC 17025 [1] is not required provided all the following apply.

a. The forensic unit has processes approved by their SAI, methods and tools to be used in this FSA based upon current practices such as Dstl's publication, 'Recovery and Acquisition of Video Evidence' [105].

b. The forensic unit or wider organisation shall record and maintain competence of personnel it authorises to conduct the above work.

c. Practitioners adhere to the the practices outlined in the appendix Video Analysis (Section 105).

79.5 Excluded from this FSA but Included in other FSAs

79.5.1 The following do not fall within the definition of 'Recovery and Processing of footage from CCTV/VSS' but are the subject of a different FSA definition.

a. FSA Definition – Specialist Video Multimedia, Recovery, Processing and Analysis (Section 80.2.1a).

79.6 Exclusions from this FSA and the Code

79.6.1 The following do not fall within the definition of 'Recovery and Processing of footage from CCTV/VSS' and will not fall under the Code.

a. Receiving CCTV/VSS files from a third party.

b. Receiving a DVR from the owner as an item.

c. Activity to assist the controlled or uncontrolled viewing of films, photographs and images by an individual who is not an eye-witness for the purposes of obtaining evidence of their recognition of a person known to them (i.e. activity governed by the Code of Practice for the identification of persons by Police Officers PACE Code D [106]).

d. Routine extraction of data from the organisation's drone and/or body worn video.

80. FSA Definition – Specialist Video Multimedia, Recovery, Processing and Analysis

80.1 Definition

80.1.1 Recovery, examination and the analysis, including comparison, of digital multimedia of persons (including faces) and items such as clothing or vehicles.

80.2 Required Compliance

80.2.1 Compliance with this Code from the effective date of the Code (see 10.1.3).

80.2.2 Accreditation to ISO 17025 [1] from the effective date of the Code (see 10.1.3), for the sub-activities the organisation undertakes which are required to be on the accreditation scope.

80.2.3 Within 24 months of the effective date of the Code (see 10.1.3) the organisation must demonstrate compliance with the Code by having a schedule of accreditation that includes the Code and reflects all FSAs (or parts thereof) that the organisation undertakes.

80.3 Sub-Activities

80.3.1 The following sub-activities are considered to constitute 'Specialist Video Multimedia, Recovery, Processing, and Analysis'.

Sub-Activities to be included in accreditation scope

80.3.2 The recovery, processing or analysis of any part of the content of an image or video file to include any of the following.

a. Recovery of CCTV/VSS footage from a DVR removed from the CCTV/VSS system i.e. when no longer ‘in situ’.

b. Recovery of CCTV/VSS footage using a third-party tool i.e. using methods other than the manufacturer intended methods.

c. Data recovery through reverse engineering.

d. Legacy analogue format conversion, enhancement or demultiplexing.

e. Enhancement/processing of digital images/video including optimisation for viewing purposes and the application of filters or techniques.

f. Production of digital stills for any subsequent FSA, including but not limited to comparison.

g. Production of video compilations i.e. not simply editing for length.

h. Redaction or masking of subjects or objects in footage using third party tools or methods outside of approved Digital Evidence Management Systems/Software.

i. Repair of damaged/corrupt media files.

80.3.3 The processing or analysis of any part of the content of an image or video file to include any of the following which are opinion evidence.

a. Pictorial image comparison.

   i. 1:1 comparison of an image against another image.

   ii. 1:1 comparison of an image against a physical object e.g. weapons, vehicles and clothing).

b. Height estimation.

c. Speed estimation from CCTV/VSS.

d. Analysis of timing information.

e. Analysis of aspect ratio.

f. Authenticity.

g. Other image content analysis (e.g. number plates, vehicles, clothing).

80.4 Note

80.4.1 The Regulator is intending to consult on whether later issues of the Code should include aspects of the use of live or retrospective facial recognition system in a future FSA.

80.5 Excluded from this FSA but Included in other FSAs

80.5.1 The following do not fall within the definition of ‘Specialist Video Multimedia, Recovery, Processing, and Analysis’ but are the subject of a different FSA definition.

a. FSA Definition – Friction Ridge Detail: Comparison (Section 58).

b. FSA Definition – Marks Comparison (Section 63).

c. FSA Definition – Footwear Mark Comparisons (Section 61).

d. FSA Definition – Recovery and Processing of Footage from CCTV/VSS (Section 79).

e. FSA Definition – Speech and Audio (Section 95).

80.6 Exclusions from this FSA and the Code

80.6.1 The following do not fall within the definition of ‘Specialist Video Multimedia, Recovery, Processing, and Analysis’ and will not fall under the Code.

a. The operation of automatic number plate recognition systems for the purposes of capture and registration numbers.

b. The creation of eFit images.

c. Activity to assist the controlled or uncontrolled viewing of films, photographs and images by an individual who is not an eyewitness for the purposes of obtaining evidence of their recognition of a person known to them (i.e. activity governed by the PACE Code of Practice D which concerns the principal methods used by police to identify people in connection with the investigation of offences [106]).

d. The searching of a captured image against a database of reference images or defined candidate list including, but not limited to, the use of live or retrospective facial recognition system.

81. FSA Definition – Technical Audio Operations

81.1 Definition

81.1.1 Recovery, preservation, and processing of audio material for downstream processing and analysis.

81.2 Required Compliance

81.2.1 Compliance with this Code from the effective date of the Code (see 10.1.3).

81.2.2 Accreditation to ISO 17025 [1] from the effective date of the Code (see 10.1.3), for the sub-activities the organisation undertakes which are required to be on the accreditation scope.

81.2.3 Within 24 months of the effective date of the Code (see 10.1.3) the organisation must demonstrate compliance with the Code by having a schedule of accreditation that includes the Code and reflects all FSAs (or parts thereof) that the organisation undertakes.

81.3 Sub-Activities

81.3.1 The following sub-activities are considered to constitute ‘Technical Audio Operations’.

Sub-Activities to be included in accreditation scope

a. Making copies of sound files.

b. Transferring sound files from one physical medium to another, e.g. from a CD to a memory stick or computer hard drive.

c. Converting sound files from one digital format to another, e.g. where the original sound file is in a proprietary non-standard format, it may need to be converted to a standard one.

d. Digitisation of recordings from old analogue sources (tapes).

e. Converting 2 channel (stereo) recordings to single channel (mono).

f. Extraction and preservation of recordings.

g. Conversion of various technical characteristics of recordings, e.g sampling rates, levels (loudness).

h. Editing/redaction of sound files.

81.4 Excluded from this FSA but Included in other FSAs

81.4.1 The following do not fall within the definition of ‘Technical Audio Operations’, but are the subject of a different FSA definition:

a. FSA Definition – Speech and Audio Analysis (Section 95).

82. FSA Definition – Document Handwriting

82.1 Definition

82.1.1 Analysis to determine the authorship of handwriting and/or signature(s).

82.2 Required Compliance

82.2.1 Compliance with this Code from the effective date of the Code (see 10.1.3).

82.2.2 Accreditation to ISO 17025 [1] from the effective date of the Code (see 10.1.3), for the sub-activities the organisation undertakes which are required to be on the accreditation scope.

82.2.3 Within 24 months of the effective date of the Code (see 10.1.3) the organisation must demonstrate compliance with the Code by having a schedule of accreditation that includes the Code and reflects all FSAs (or parts thereof) that the organisation undertakes.

82.3 Sub-Activities

82.3.1 The following sub-activities are considered to constitute ‘Document Handwriting’.

Sub-Activities to be included in accreditation scope

a. Analysis to determine whether handwriting and/or a signature(s) have been produced by:

i. a specific person (by comparison with their reference writing and/or reference signature(s));

ii. the same person as has produced handwriting and/or signature(s) on any other part the same document; or

iii. the same person as has produced handwriting and/or signatures on any part of a separate document.

82.4 Note

82.4.1 The sub-activities above apply to examination of any of the following.

a. Handwriting and/or signatures produced by human movement, whether or not visible to the unaided human eye.

b. Original handwriting and/or signatures produced by human movement or images of original handwriting and/or signatures produced by human movement.

c. Any handwriting and/or signature resulting from the human movement by an electronic capture device.

82.4.2 Any document refers to a physical item such as a piece of paper or a page in a book or an image(s) (electronic or printed) of a physical document(s) or parts of a physical document(s).

82.5 Excluded from this FSA but Included in other FSAs

82.5.1 The following do not fall within the definition of ‘Document Handwriting’ but are the subject of a different FSA definition.

a. FSA Definition – Document Authenticity and Origin (Section 83).

82.6 Exclusions from this FSA and the Code

82.6.1 The following do not fall within the definition of ‘Document Handwriting’ and will not fall under the Code.

a. The consideration of the authorship of handwriting or signatures based on personal knowledge rather than scientific evaluation.

b. The consideration of personality traits of an individual by reference to features of their handwriting.

c. The consideration of the authorship of handwriting or signatures based on an assessment of personality traits.

d. The consideration of the authorship of any electronically generated handwriting or signature which is not the result of human movement.

83. FSA Definition – Document Authenticity and Origin

83.1 Definition

83.1.1 Examination and/or analysis of the authenticity of a document to determine whether it is (in its entirety or in part):

a. what it purports to be;

b. an imitation; and/or

c. an authentic but altered example of what it purports to be.

83.1.2 Examination and/or analysis of the origin or method of manufacture of the entirety or constituent parts of a document.

83.1.3 Examination and/or analysis of links between constituent parts of the same or different documents based on materials and methods of manufacture.

83.2 Required Compliance

83.2.1 Compliance with this Code from the effective date of the Code (see 10.1.3).

83.2.2 Accreditation to ISO 17025 [1] from the effective date of the Code (see 10.1.3), for the sub-activities the organisation undertakes which are required to be on the accreditation scope.

83.2.3 Within 24 months of the effective date of the Code (see 10.1.3) the organisation must demonstrate compliance with the Code by having a schedule of accreditation that includes the Code and reflects all FSAs (or parts thereof) that the organisation undertakes.

83.3 Sub-Activities

83.3.1 The following sub-activities are considered to constitute ‘Document Authenticity and Origin’.

Sub-Activities to be included in accreditation scope

a. Examination and/or analysis to determine whether a document, or any part of a document, including the text or images within a document have been produced by:

i. any specific equipment;

ii. the same equipment as produced any part of a separate document;

iii. the same materials as any part of the same document (including physical fits between torn or cut paper); and/or

iv. the same materials as any part of a separate document (including physical fits between torn or cut paper).

b. Examination and/or analysis to determine the type of equipment (e.g. type of printer or specific model of printer) and/or materials which were used to create, change, or alter the appearance of a document.

c. Relative dating of a document or documents, or of a specified part of a document.

i. Relative dating can include the determination of, for example, whether a document can only have been produced before or after a certain date because of its specific method of production, materials used in its production, or the content of the text it bears. It can also include sequencing of entries.

d. Examination and/or analysis to determine whether a document has been altered or the appearance changed after its creation or after a relevant significant event (e.g. its signature, the affixing of any stamp/seal etc).

e. Anything done (whether directly or indirectly) to make visible, or to recover, text or images which are present but not visible to the unaided eye. This includes indented or erased writing.

f. The examination and/or analysis of a document for the purpose of determining the presence of security features by, but not limited to the following.

i. The use of light sources (including those wavelengths outside the visible spectrum) and magnification, perhaps combined with imaging processes.

83.4 Note

83.4.1 The sub-activities above apply to any of the following.

a. Any document containing text or images even if the text or image is not visible to the unaided human eye.

b. Any text, including indented or erased writing, or images which forms part of the document.

c. Any marks on the document.

d. Any equipment which may be used to create, copy, or alter the appearance of a document (even if the copy is not a physical document).

e. The examination of any materials which may form a document, part of a document or be used to change a document or alter the appearance of a document.

f. Paper or other substrate including the physical fit of torn or cut paper.

g. Inks or other marking materials.

83.4.2 The term ‘materials’ means inks, paper, bindings and such like.

83.4.3 Any document refers to a physical item such as a piece of paper or a page in a book or an image(s) (electronic or printed) of a physical document(s) or parts of a physical document(s).

83.5 Excluded from this FSA but Included in other FSAs

83.5.1 The following do not fall within the definition of ‘Document Authenticity and Origin’ but are the subject of a different FSA definition.

a. FSA Definition – Marks Visualisation and Enhancement(Section 62).

b. FSA Definition – Damage and Physical Fit (Section 64).

c. FSA Definition – Document Handwriting (Section 82).

83.6 Exclusions from this FSA and the Code

83.6.1 The following do not fall within the definition of ‘Document Authenticity and Origin’ and will not fall under the Code.

a. Any consideration of whether any of the following is true based on personal knowledge rather than scientific evaluation:

i. whether a document is genuine; and/or

ii. whether a document has been modified after its creation or any relevant significant event.

F4 - FSAs – Definitions not subject to this Code

84. FSA Definition – Examination of Incidents Involving Vehicles

84.1 Definition

84.1.1 Examination to determine circumstances of an incident involving a road vehicle (e.g. collision).

84.1.2 This activity applies to a practitioner who is commissioned to carry out a planned examination of a scene and for whom this is their primary role.

84.2 Required Compliance

84.2.1 This FSA is not subject to this version of this Code therefore this FSA has no requirements set including any for accreditation.

84.2.2 See the Note in section 84.4.

84.3 Sub-Activities

84.3.1 The following sub-activities are considered to constitute ‘Examination of Incidents involving Vehicles’.

a. Activities at a location related to an incident, as described below, with the aim of determining the people and circumstances involved in the events which led to the incident, or which occurred following the incident.

i. Where a road vehicle has crashed.

ii. Where a road vehicle has come into contact with another road vehicle, other vehicle (of any description), any person or animal.

iii. Where a road vehicle has come into contact with any stationary object.

b. Any examinations, analysis or calculations related to the activities described above.

i. This includes physical fit of vehicle parts if conducted at scene.

ii. This includes interrogation of telematic/entertainment systems.

84.4 Note

84.4.1 The Regulator intends to issue guidance documents for this FSA to support accreditation to ISO 17020 [2] and intends to incorporate these guidance documents into the next version of this Code as an appendix. This intended addition will be subject to consultation as set out in s3 of the Act [10].

84.5 Excluded from this FSA but Included in other FSAs

84.5.1 The following do not fall within the definition of ‘Examination of Incidents involving Vehicles’ but are the subject of a different FSA definition.

a. FSA Definition – Toxicology: Analysis for Drug(s), Alcohol, and/or Noxious Substances (Section 53).

b. FSA Definition – Examination and Analysis of Vehicle Components (Section 73).

c. FSA Definition – Specialist Video Multimedia, Recovery, Processing and Analysis (Section 80) (i.e. speed estimation).

84.6 Exclusions from this FSA and the Code

84.6.1 The following do not fall within the definition of ‘Examination of Incidents involving Vehicles’ and will not fall under the Code.

a. Activity undertaken to protect/preserve items/exhibits from imminent alteration or destruction unless by persons specifically commissioned to carry out an FSA as determined within this Code.

b. Any investigation related to determining the cause of an air or rail crash except in cases of suspected deliberate explosives attacks.

c. Any investigation related to determination of the cause of the sinking of a vessel (capable of travelling on, or under, the water) at sea or on inland waters.

85. FSA Definition – Examination of Fire Scenes

85.1 Definition

85.1.1 Examination of a fire scene, usually to establish the origin, cause, and development/spread of a fire.

85.1.2 This activity applies to a practitioner who is commissioned to carry out a planned inspection of a scene and whose primary role is that.

85.2 Required Compliance

85.2.1 This FSA is not subject to this version of this Code therefore this FSA has no requirements set including any for accreditation.

85.2.2 See the Note in section 85.4.

85.3 Sub-Activities

85.3.1 The following sub-activities are considered to constitute ‘Examination of Fire Scenes’.

a. Consideration of the appropriate resource required for a person to attend a scene of a fire and initial assessment of likely requirements and advice.

b. Activities at a relevant location with the aim of locating, recognising, and/or recovering items, or materials, which may be evidence, or which may give rise to evidence relating to cause and origin of the fire.

c. Any presumptive examinations, analysis or calculations related to the activities described above.

85.4 Note

85.4.1 In this section the term ‘relevant location’ means the following.

a. Any location which is a place where a fire has occurred.

85.4.2 The Regulator intends to issue guidance documents for this FSA to support accreditation to ISO 17020 [2] and intends to incorporate these guidance documents into the next version of this Code as an appendix. This intended addition will be subject to consultation as set out in s3 of the Act [10].

85.5 Excluded from this FSA but Included in other FSAs

85.5.1 The following do not fall within the definition of ‘Examination of Fire Scenes’ but are the subject of a different FSA definition:

a. FSA Definition – Analysis of Ignitable Liquids and their Residues (Section 68).

85.6 Exclusions from this FSA and the Code

85.6.1 The following do not fall within the definition of ‘Examination of Fire Scenes’ and will not fall under the Code.

a. Activity undertaken to protect/preserve items/exhibits from imminent alteration or destruction unless by persons specifically commissioned to carry out an FSA as determined within this Code.

b. Any investigation related to determining the cause of an air or rail crash except in cases of suspected deliberate explosives attacks.

c. Any investigation related to determination of the cause of the sinking of a vessel (capable of travelling on, or under, the water) at sea or on inland waters.

86. FSA Definition – Examination to Establish the Origin and Cause of an Explosion

86.1 Definition

86.1.1 Examination of an explosion scene, usually to establish the origin and cause of an explosion.

86.1.2 This activity applies to a practitioner who is commissioned to carry out a planned inspection of a scene and whose primary role is that.

86.2 Required Compliance

86.2.1 This FSA is not subject to this version of this Code therefore this FSA has no requirements set including any for accreditation.

86.3 Sub-Activities

86.3.1 The following sub-activities are considered to constitute ‘Examination to Establish the Origin and Cause of an Explosion’.

a. Consideration of the appropriate resource required for a person to attend a scene of an explosion and any initial assessment of likely requirements and advice.

b. The activities at a relevant location with the aim of locating, recognising, or recovering items, or materials, which may be evidence, or which may give rise to evidence relating to cause and origin of the explosion.

c. Activities at any relevant location with the aim of determining the events which led to the incident.

d. Any presumptive examinations, analysis or calculations related to the activities described above.

86.4 Note

86.4.1 In this section the term ‘relevant location’ means the following.

a. Any location which is a place where an explosion has occurred.

86.5 Excluded from this FSA but Included in other FSAs

86.5.1 The following do not fall within the definition of ‘Examination to Establish the Origin and Cause of an Explosion’ but are the subject of a different FSA definition.

a. FSA Definition – Examination and Analysis of Explosives, Explosives Precursors, and Explosive Residues (Section 75).

b. FSA Definition – Examination and Analysis of Suspected Explosive Devices (Section 93).

86.6 Exclusions from this FSA and the Code

86.6.1 The following do not fall within the definition of ‘Examination to Establish the Origin and Cause of an Explosion’ and will not fall under the Code.

a. Activity undertaken to protect/preserve items/exhibits from imminent alteration or destruction unless by persons specifically commissioned to carry out an FSA as defined within this Code.

b. Any investigation related to determining the cause of an air or rail crash except in cases of suspected deliberate explosives attacks.

c. Any investigation related to determination of the cause of the sinking of a vessel (capable of travelling on, or under, the water) at sea or on inland waters.

87. FSA Definition – Forensic Examination of Detainees

87.1 Definition

87.1.1 Recovery of material from detainees (which may be subject to further testing) believed to be relevant to an alleged involvement in an offence.

87.2 Required Compliance

87.2.1 This FSA is not subject to this version of this Code therefore this FSA has no requirements set including any for accreditation.

87.3 Sub-Activities

87.3.1 The following sub-activities are considered to constitute ‘Forensic Examination of Detainees’.

a. Activities with the aim of locating, recognising and recording material which may be evidence or give rise to evidence.

i. Recording of evidence may include the use of image capture devices for specialist image capture/photo-documentation in general and intimate images, and/or the use of body diagrams/maps to record the presence, location, and measurements of injuries and marks, or the absence of injuries and marks.

ii. Material believed to be evidence may be biological or non-biological and includes particulate trace material.

b. The recovery of items. This includes obtaining Friction Ridge Detail (FRD) prints, toxicology and drugs samples, footwear prints, and DNA reference samples.

i. This includes recovery to enable body fluid distribution analysis and/or interpretation to be carried out (see FSA Definition – Human Body Fluid Distribution Analysis and FSA Definition – Incident Scene Examination).

87.4 Exclusions from this FSA and the Code

87.4.1 The following do not fall within the definition of ‘Forensic Examination of Detainees’ and will not fall under the Code.

a. Consideration of whether an individual is fit to be interviewed and/or detained.

b. The activities of a person other than the practitioner (including police), who is taking steps to protect/preserve or collect evidence.

c. Taking dental impressions.

d. Obtaining facial images (e.g. photos) for the purpose of identification and/or crime comparison.

88. FSA Definition – Forensic Examination of Deceased Individuals

88.1 Definition

88.1.1 Recovery of material (which may be subject to further testing) from a deceased individual (or parts of a deceased individual) believed to be relevant to the circumstances and/or person(s) involved in the death of an individual.

88.1.2 The sub-activities listed below may occur at different locations (including at incident scenes (Section 46) and be prior to, during, and/or after a post-mortem examination.

88.2 Required Compliance

88.2.1 This FSA is not subject to this version of this Code therefore this FSA has no requirements set including any for accreditation.

88.3 Sub-Activities

88.3.1 The following sub-activities are considered to constitute ‘Forensic Examination of Deceased Individuals’.

a. Activities with the aim of locating, recognising and recording material which may be evidence or give rise to evidence.

i. Recording of evidence may include specialist image capture/photo-documentation in general and intimate images, the use of body diagrams/maps, mark casting, and/or the use of mobile biometric devices.

ii. Material believed to be evidence may be biological or non-biological and includes particulate trace material.

b. Locating, recognising and recovering items or material for further testing. This includes obtaining Friction Ridge Detail (FRD) prints, toxicology and drugs samples, and DNA reference samples.

i. This includes recovery to enable body fluid distribution analysis and/or interpretation to be carried out (See FSA Definition – Human Body Fluid Distribution Analysis– Section 49) (See FSA Definition – Incident Scene Examination – Section 46).

88.4 Exclusions from this FSA and the Code

88.4.1 The following do not fall within the definition of ‘Forensic Examination of Deceased Individuals’ and will not fall under the Code.

a. Activity performed at a post-mortem examination for the purpose of establishing cause and/or time of death.

b. The activities of a person other than the practitioner (including police), who is taking steps to protect/preserve or collect evidence.

c. Taking dental impressions.

89. FSA Definition – Non-Human Biological Examination: Plants, Microbes, and Invertebrates

89.1 Definition

89.1.1 Examination and analysis to determine species and/or the potential source of plant, microbial, and/or invertebrate material.

89.2 Required Compliance

89.2.1 This FSA is not subject to this version of this Code therefore this FSA has no requirements set including any for accreditation.

89.3 Sub-Activities

89.3.1 The following sub-activities are considered to constitute ‘Non-Human Biological Examination: Plants, Microbes, and Invertebrates’.

a. Morphological examination of relevant material.

i. Relevant material refers to any part of a plant, (including seeds, pollen, spores), microbes, and/or invertebrates.

b. Macroscopic, microscopic, and immunological tests for species identification.

c. DNA analysis for species identification, pedigree analysis, and microbial profiling.

d. The comparison, interpretation, including use of reference databases (see 31) and any statistical analysis.

e. Entomology, including analysis of invertebrate lifecycles to assess time of death.

89.4 Excluded from this FSA but Included in other FSAs

89.4.1 The following do not fall within the definition of ‘Non-Human Biological Examination: Plants, Microbes, and Invertebrates’ but are the subject of a different FSA definition.

a. FSA Definition – Human DNA Analysis (Section 50).

b. FSA Definition – Non-Human Biological Examination: Vertebrates (Section 52).

c. FSA Definition – Case Review (Section 96).

89.5 Exclusions from this FSA and the Code

89.5.1 The following do not fall within the definition of ‘Non-Human Biological Examination: Plants, Microbes, and Invertebrates’ and will not fall under the Code.

a. Examination and/or analysis to determine geographical provenance of plant, microbe, and/or invertebrate material.

90. FSA Definition – Toxicology: Alcohol Technical Calculations

90.1 Definition

90.1.1 Alcohol technical calculations and consideration of alternative propositions based on evidential breath, blood or urine concentrations, critical timings, height weight and gender, and claimed drinking patterns.

90.2 Required Compliance

90.2.1 This FSA is not subject to this version of this Code therefore this FSA has no requirements set including any for accreditation.

90.3 Sub-Activities

90.3.1 The following sub-activities are considered to constitute ’Toxicology: Alcohol Technical Calculations’.

a. Any of the following activities undertaken in relation to an offence under the Road Traffic Act 1988 [92], the Transport and Works Act 1992 [93], or the Railways and Transport Safety Act 2003 [94], and where appropriate other casework toxicology:

i. the estimation of breath, blood, or urine alcohol concentrations at any time other than the time of measurement, based on the measurement of the concentration of alcohol in blood, breath or urine, and declared drinking pattern;

ii. the estimation of breath, blood, or urine alcohol levels at any time based on a stated pattern of drinking;

iii. the consideration of the possible impact of drinking alcohol at a specific time on the concentration of alcohol in breath, blood, or urine at the specific time;

iv. the consideration of the possible impact of imbibing a ‘spiked’ drink on the concentration of alcohol in breath, blood, or urine at any time;

v. the consideration of the concentration of alcohol in blood/breath at a stated time of next driving;

vi. the interpretation of the overall observations from the aspects of mathematics, physiology, and relevant contextual information, to assess the credibility of the driver’s account;

b. Consideration of any of the following matters:

i. the observations of any of the work above;

ii. the significance of the observations of the activities discussed above in relation to the concentration of alcohol in breath, blood, or urine at any time;

iii. the significance of the observations of the activities above in relation to the impairment of a driver at any given time;

iv. the rate at which alcohol may be absorbed and eliminated by a person based on age, weight, and sex.

c. If conducted the following are covered by this FSA:

i. the consideration of the potential impact of the measurement/analysis method on the reliability of the concentration of alcohol in breath, blood or urine or whether that concentration was above a legal limit; and

ii. the consideration of the potential impact of any factors extraneous to the measurement/analysis on the reliability of the determination of the concentration of alcohol in breath, blood or urine or whether that concentration was above a legal limit.

d. The evaluation of the likelihood of alcohol appearing in the body by means of some route other than consumption, such as by inhalation, auto-brewery syndrome, vapes, foods, medications and through the use of skin wipes; and/or

e. The possible effect, if any, of regurgitation and vomiting on breath analysis.

90.4 Excluded from this FSA but Included in other FSAs

90.4.1 The following do not fall within the definition of 'Toxicology: Alcohol Technical Calculations' but are the subject of a different FSA definition.

a. FSA Definition – Toxicology: Analysis for Drugs and Alcohol under the Road Traffic Act 1988, Transport and Works Act 1992, and Railways and Transport Safety Act 2003 (Section 54).

b. FSA Definition – Toxicology: Analysis for Drugs in Relation to s5A of the Road Traffic Act 1988 (Section 55).

c. FSA Definition – Toxicology: Analysis for Drug(s), Alcohol, and/or Noxious Substances (Section 53).

91. FSA Definition – Examination and Analysis relating to the Preparation and Production of Drugs and/or Psychoactive Substances

91.1 Definition

91.1.1 Examination and/or analysis of materials (including packaging and paraphernalia) used, or suspected of use, in the preparation and/or production of material believed to be drugs or psychoactive substances.

91.1.2 Consideration of the production, method of synthesis or cultivation and/or yield of drugs or psychoactive substances.

91.2 Required Compliance

91.2.1 This FSA is not subject to this version of this Code therefore this FSA has no requirements set including any for accreditation.

91.3 Sub-Activities

91.3.1 The following sub-activities are considered to constitute ‘Examination and Analysis relating to the Preparation and Production of Drugs and/or Psychoactive Substances’.

a. The examination and/or analysis of any item/exhibit, or material recovered from an item, and the interpretation of observations to determine.

i. Whether it could be employed in the preparation to supply, or production of a relevant substance.

ii. Whether it can be connected to a particular production or supply source of a relevant substance.

b. Analysis to determine the actual yield, or potential yield, of any means of production of a relevant substance.

c. Drug/psychoactive substance identification including use of reference databases (see 31).

d. Consideration of any of the following:

i. the synthetic routes to produce drugs;

ii. what drugs may be synthesised from given compounds;

iii. the legal classification of any relevant substance that could be produced;

iv. common associated materials as evidence of preparation to supply particular drugs; and/or

v. common equipment/paraphernalia as evidence of production of particular drugs.

91.4 Note

91.4.1 In this section the term ‘relevant substance’ means anything falling within the descriptions below.

a. Any substance which is listed (by name or by virtue of its chemical structure) in any Schedule to the Misuse of Drugs Act 1971 [90].

b. Any substance which is a psychoactive substance within the provisions of the Psychoactive Substances Act 2016 [91].

91.4.2 In this section the term ‘associated material(s)’ includes cutting agents, additives, and diluents.

91.5 Excluded from this FSA but Included in other FSAs

91.5.1 The following do not fall within the definition of ‘Examination and Analysis relating to the Preparation and Production of Drugs and/or Psychoactive Substances’ but are the subject of a different FSA definition.

a. FSA Definition – Toxicology: Analysis for Drug(s), Alcohol, and/or Noxious Substances (Section 53).

b. FSA Definition – Friction Ridge Detail: Visualisation and Enhancement (Section 57).

c. FSA Definition – Analysis to Identify and Quantify Drugs and/or Associated Materials (Section 56).

91.6 Exclusions from this FSA and the Code

91.6.1 The following do not fall within the definition of ‘Examination and Analysis relating to the Preparation and Production of Drugs and/or Psychoactive Substances’ and will not fall under the Code.

a. The testing of any item, or part thereof, to determine whether it is comprised of or contains a relevant substance in the circumstances set out below:

i. with a Home Office approved kit under the processes permitted by a Home Office Circular;

ii. with a Home Office approved kit under the processes set out in the Evidential Drug Identification Testing (EDIT) programme.

b. Drugs value estimation.

c. The provision of any evidence in relation to whether a particular compound (or group or class of compounds) is psychoactive in relation to the provisions of the Psychoactive Substances Act 2016 [91].

d. The screening of items for drugs at an airport or other transport hub.

92. FSA Definition – Examination and Analysis of Radioactive Material

92.1 Definition

92.1.1 The examination and analysis of radioactive material to provide information to a criminal investigation and evidence in criminal proceedings.

92.2 Required Compliance

92.2.1 This FSA is not subject to this version of this Code therefore this FSA has no requirements set including any for accreditation.

92.3 Sub-Activities

92.3.1 The following sub-activities are considered to constitute ‘Examination and Analysis of Radioactive Material’.

a. The examination of any item/exhibit to determine whether relevant material is present.

b. The recovery of any relevant material or item/exhibit of the descriptions below:

i. an item/exhibit comprised of or contains relevant material; and/or

ii. an item/exhibit which has relevant material on it.

c. The examination and/or analysis of any item or matter to determine any of the following:

i. the identification of an isotope;

ii. the potential immediate source (i.e. device) of relevant material;

iii. the degree of similarity of different samples of relevant material; and/or

iv. the degree of similarity of a sample of relevant material to any reference material or sample of known origin.

d. Determination of the potential geographical origin (i.e. nation, geographical location, or production facility) of any relevant material.

92.4 Note

92.4.1 Subject to the points below, relevant material means any of the following.

a. A radioactive substance held in circumstances where the possession amounts to a criminal offence other than an offence under laws related to:

i. health and safety at work; or

ii. environmental protection.

b. A radioactive substance which is held with the intention that it may be used for, or to facilitate, the commission of a criminal offence.

c. Any radioactive substance which is being used for, or to facilitate, the commission of a criminal offence.

d. Any radioactive material which has contaminated any person or location as the result of a criminal offence or attempt to commit an offence.

92.4.2 The radioactive nature of the substance must be a significant factor in the nature of the criminal offence referred to above.

92.4.3 The definition of the criminal offence need not refer to radioactive material.

92.4.4 In this section radioactive substance means material which would be radioactive material under the provisions of the Radioactive Substances Act 1993 [107].

92.4.5 Any externally provided information relied upon for the above sub-activities must be made sure to be suitable.

93. FSA Definition – Examination and Analysis of Suspected Explosive Devices and Associated Material

93.1 Definition

93.1.1 Examination and analysis of suspected explosive devices, component parts of devices or remnant parts of such a device.

93.2 Required Compliance

93.2.1 This FSA is not subject to this version of this Code therefore this FSA has no requirements set including any for accreditation.

93.3 Sub-Activities

93.3.1 The following sub-activities are considered to constitute ‘Examination and Analysis of Explosive Devices’.

a. The examination of any item/exhibit to determine whether relevant material is present.

b. The recovery of any relevant material or item.

c. The examination and/or analysis of any item/exhibit to determine any of the following:

i. the explosives significance of the relevant material;

ii. the cause and/or circumstances of an explosion;

iii. the composition of the explosive device;

iv. the potential viability of the explosive device;

v. the potential of the explosive device to cause harm to people or damage to property; and/or

vi. the result, or potential result, of the use of an explosive device.

93.4 Note

93.4.1 In this section relevant material means any of the following.

a. Components of explosive devices, including electrical components.

b. Literature or other medium (e.g. video) providing instructions for the preparation of explosive devices.

c. Materials other than an explosive substance or chemical accelerant which could be used to modify the nature of an explosion, including shrapnel.

93.4.2 The term ‘explosive substance’ shall cover any component part which would be subject to the provisions of the Explosives Act 1875 [101], the Explosive Substances Act 1883 [97], or the Explosives Regulations 2014 [102].

93.5 Excluded from this FSA but Included in other FSAs

93.5.1 The following do not fall within the definition of ‘Examination and Analysis of Explosive Devices’ but are the subject of a different FSA definition.

a. FSA Definition – Examination and Analysis of Explosives, Explosives Precursors, and Explosive Residues (Section 75).

b. FSA Definition – Examination of Fire Scenes (Section 85).

93.6 Exclusions from this FSA and the Code

93.6.1 The following do not fall within the definition of ‘Examination and Analysis of Explosive Devices’ and will not fall under the Code.

a. Screening of items/persons/locations for explosives residue, including the screening of people at an airport or other transport hub.

94. FSA Definition – Network Capture and Analysis

94.1 Definition

94.1.1 Capture and analysis of network traffic to understand the properties/setup of the network, including at scenes of incident.

94.2 Required Compliance

94.2.1 This FSA is not subject to this version of this Code therefore this FSA has no requirements set including any for accreditation.

94.3 Sub-Activities

94.3.1 The following sub-activities are considered to constitute ‘Network Capture and Analysis’.

a. Traffic collection and analysis.

b. Packet collectors (sniffers), protocol analysers and Network Forensic Analysers.

c. Network Topology Diagram including information gathering about network setup.

d. Data-link and physical layer analysis (Ethernet).

e. Transport and network layer analysis (TCP/IP).

f. Netflow analysis.

g. DNS review/analysis.

h. Dynamic Host Configuration Protocol Review.

i. Application layer analysis (e.g. HTTP, FTP, SMTP, encryption).

95. FSA Definition – Speech and Audio Analysis

95.1 Definition

95.1.1 The analysis and processing of recorded speech and audio, and the assessment of witness claims relating to speech or other sounds.

95.2 Required Compliance

95.2.1 This FSA is not subject to this version of this Code therefore this FSA has no requirements set including any for accreditation.

95.3 Sub-Activities

95.3.1 The following sub-activities are considered to constitute ‘Speech and Audio Analysis’.

a. Real-time acquisition of analogue or digital audio.

b. Audio processing with the aim of improving listenability/intelligibility (often referred to as audio enhancement).

c. Speaker comparison. Comparison of an audio recording of a speaker of questioned identity with one or more audio recordings of a speaker of known identity (or the comparison of two audio recordings each of a speaker of questioned identity), to reach an opinion regarding whether or not the recordings are of the same speaker or are of two different speakers from the same population.

d. Specialist transcription. Generation of a written version of the words spoken by a speaker or speakers on an audio recording by a Specialist.

e. Questioned content analysis. Analysis of the acoustic properties of a short section of speech on an audio recording (e.g., a word, or phrase) and interpretation of the observations to reach an opinion regarding whether the speaker said one particular word or phrase or another particular word or phrase.

f. Authenticity analysis. Examining recordings to assess their provenance and/or for evidence of the recordings having been edited/tampered with.

g. Electrical Network Frequency (ENF) analysis of mains frequency interference in recordings.

h. Speaker profiling. Examining a recording of an unknown voice for information about the speaker.

i. Voice parade design (the auditory equivalent of visual identification parades).

j. Sound propagation analysis, usually at incident scenes, of the propagation of sound to determine audibility at specific locations.

k. Examining a sound in a recording to determine its source/cause.

l. Assessing lay-witness testimony on speaker recognition – to determine likely reliability of claims to have identified a voice.

95.4 Excluded from this FSA but Included in other FSAs

95.4.1 The following do not fall within the definition of ‘Speech and Audio Analysis’ but are the subject of a different FSA definition.

a. FSA Definition – Data Capture and Processing from Digital Storage Devices (Section 76).

b. FSA Definition – Specialist Video Multimedia, Recovery, Processing and Analysis (Section 80).

c. FSA Definition – Technical Audio Operations (Section 81).

96. FSA Definition – Case Review

96.1 Definition

96.1.1 The re-examination of ongoing, completed, unsolved, or otherwise unresolved cases, results, and/or interpretations to identify additional forensic opportunities and/or to address the alternative propositions. This includes re-examination performed by both the original forensic unit/provider involved in the case, or an independent forensic unit/provider.

96.1.2 Post-conviction appeal cases and Criminal Cases Review Commission cases are within scope of this FSA.

96.2 Required Compliance

96.2.1 This FSA is not subject to this version of this Code therefore this FSA has no requirements set including any for accreditation.

96.3 Sub-Activities

96.3.1 The following sub-activities are considered to constitute ‘Case Review’.

a. Review of relevant previous forensic findings in the context of the most up-to-date case circumstance information (which may be different to that which was previously available), and with knowledge of all currently available material.

i. Relevant findings, including physical and digital evidence, should be reviewed.

ii. All sample types across multiple scientific disciplines may be considered and will be dependent on the content of the original case.

iii. Examination of multiple layers of historical packaging. In some cases, it may be necessary to recover debris, take control DNA samples, and re-exhibit layers of packaging before examining the exhibit itself.

b. Consideration of:

i. whether the nature and scope of scientific investigations are/were appropriate to the case circumstances;

ii. whether the examined items were the correct and appropriate ones;

iii. the methodology for arriving at the scientific findings, and the limitations of applied methods;

iv. the continuity and integrity of items;

v. the results, quality assurance measures, and critical findings checks to ascertain what can be reliability concluded, and what might have been missed; and

vi. the reliability and validity of previous findings.

c. Consideration to identify new opportunities, in the light of current and potential future technologies.

d. Consideration to identify exhibits and/or retained materials to be located and submitted.

e. Conduct and/or supervise new examinations and analysis.

i. New examinations and analysis arising from the case review process that are conducted by the forensic unit/provider undertaking the case review and/or by 3rd party organisations need to comply with the relevant FSA and have the appropriate accreditation. The results of externally provided examination and analysis need to be fully incorporated into the review and interpretations.

f. Preservation of material, with a consideration of scientific developments, to facilitate future reviews.

g. Interpretation of observations from new examination/analysis, which may include interrogation of databases, with consideration given to scientific papers and new research.

96.4 Exclusions from this FSA and the Code

96.4.1 The following do not fall within the definition of ‘Case Review’ and will not fall under the Code.

a. Review of work related to provision of medical care.

b. Review of post-mortem examination work relating to determining cause and/or time of death.

97. FSA Definition – Control and Management of a Forensic Database Service

97.1 Definition

97.1.1 The provision of a database service through the operation and administration of forensic database systems to:

a. identify links between data recovered from incidents to other incidents and/or persons of interest.

b. support the validation of search algorithms, training, and proficiency testing (i.e. Ground truth databases)

c. make inferences and/or interpret case specific findings.

97.2 Required Compliance

97.2.1 This FSA is not subject to this version of this Code therefore this FSA has no requirements set including any for accreditation.

97.3 Sub-Activities

97.3.1 The following sub-activities are considered to constitute ‘Control and Management of a Forensic Database Service’.

a. The receipt and acceptance of submitted data.

b. The control, management, quality oversight, and monitoring of data integrity and processing.

c. The storage of data.

d. The searching and retrieval of data.

e. The control, management, quality oversight, and monitoring of the database system.

f. Validation of database software including matching algorithms and provision of validation results.

g. Provision of:

i. Potential forensic links.

ii. Statistical information.

iii. Sample data.

h. The retention/destruction of data.

97.4 Note

97.4.1 Section 42.2.4 l, lists the current expected scope for this FSA. The Regulator is intending to consult on whether later issues of the Code should include other databases that offer a service.

97.5 Exclusions from this FSA and the Code

97.5.1 The following do not fall within the definition of ‘Forensic Database Control and Management’ and will not fall under the Code.

a. Activity relating to the INTERPOL Database(s).

b. Collections of literature.

F5 - Appendices

98. Sexual Assault Examination: Requirements for the Assessment, Collection and Recording of Forensic Science Related Evidence

98.1 Scope

98.1.1 This section covers the forensic medical examination, recovery of material and recording of information from complainants of alleged sexual assault routinely [174] undertaken in a dedicated facility (forensic unit) for that purpose. It does not include medical practices nor clinical governance activities. For the purposes of this section complainants will be referred to as patients.

98.2 Standards and Guidance

98.2.1 To facilitate the realisation of accreditation to ISO 15189 [18] and compliance with the requirements of this Code, guidance is issued under the provisions of section 9(1) of the 2021 Act [10] and forensic units and practitioners undertaking FSA Definition – Forensic Examination of Sexual Offence Complainants shall have due regard to the following.

a. Validation [33];

b. The Control and Avoidance of Contamination in Forensic Medical Examinations [32].

c. DNA contamination detection -The management and use of staff elimination DNA databases [108].

d. The Assessment, Collection and Recording of Forensic Science Related Evidence in Sexual Assault Examinations [109].

98.3 Organisation and Management Responsibility

[174] The use of ad hoc locations such as emergency departments and care homes are not included; however, anti-contamination good practice for the examination and recovery is expected.

98.3.1 A senior manager from the service provider with responsibility for the facility shall be identified, to support the quality standards.

98.3.2 Management within the facility shall conform to the requirements of the international quality standard ISO 15189 [18] , substituting ‘facility’ where the standard states ‘laboratory’. The management requirements shall include:

a. the organisation and management responsibility of the facility shall be defined and documented;

b. legal entity and SAI shall be determined so that it is clear which organisation can be held legally responsible for the facility’s activities (ISO 15189 4.1.1.2 [18]) and who the contact is for the Forensic Science Regulator.

98.4 Quality Management System

98.4.1 A quality management system (however called) shall be established, comply with section 4 of ISO 15189 [18] and shall incorporate the requirements of this Code into policy and procedures as appropriate to the activities being undertaken.

98.5 Technical Requirements

Personnel: Training and Competence

98.5.1 The employing body, whether responsible for the facility directly or as a service provider commissioned to work at that facility, shall for the staff in their employ have a documented policy defining the knowledge, skills, experience and competency, and a procedure for the training, competency and ongoing competency for each role within the facility. This shall include:

a. all records to evidence competency and authorisation.

b. training and competency requirements including retraining for any lapse of competence for each role profile;

c. where relevant, expert witness and CJS related training [35], [26] including written evidence, court skills and avoiding cognitive bias [23];

d. assessment of training and competency;

e. authorisation and commencement for the activities that their staff undertake;

f. continuing professional development to maintain ongoing competency;

g. annual review and appraisal regarding each individual's performance; and

h. records to evidence competency and authorisation.

98.5.2 If not employed by the legal entity or the facility but providing a service (ISO 15189 4.4, 4.6, 5.1 [18] and ILAC G19 4.1.3 [3]), then assessment and approval to work at the facility shall be evidenced and documented by the facility, prior to the start of any contract.

Accommodation and Environmental Conditions

General

98.5.3 Accommodation at the facility shall be fit to meet the well-being, medical, and forensic examination needs of all its end users in a secure environment for both users and staff.

98.5.4 In order to meet the accommodation and environmental requirements if physical building changes or new build have been identified or are necessary, the facility shall undertake the following.

a. Complete a full risk assessment and identify areas for strict ongoing monitoring.

b. Implement the risk mitigation and record quality failures.

c. Have a documented plan for improvements with timescales that are reviewed at least once every 6 months.

d. As a minimum disclose in all reports to CJS end users that the facility does not meet the requirements in this standard and detail what mitigation is in place.

98.5.5 The facility shall have in place policies and procedures for the authorised access to the building, rooms, areas, equipment, and consumables. These shall include controlled areas and rooms that require access to be recorded.

Layout of the accommodation

98.5.6 Consideration shall be given to the design and layout of the facility. This shall include measures to prevent cross-transfer and environmental contamination.

98.5.7 There shall be designated patient bathroom and medical examination areas cleaned to DNA standards as set out in FSR-G-212 [109]. These shall be secure at all times and entry and exit shall be controlled.

Air quality and air flow

98.5.8 Air movement within and between rooms shall be managed with measures taken to minimise the risk of contamination from environmental background DNA. Further detail can be found in FSR-G-212 [109].

Forensic Medical Examination Room Furnishings, Equipment, Reagents, and Consumables

98.5.9 The furnishings, equipment, reagents and consumables that are utilised within the facility shall be such that they minimise the risk of DNA contamination.

Environment, furnishings and equipment

98.5.10 The walls, floors, work surfaces, and chairs should be of smooth finish, sealed, readily cleanable and resistant to degradation from frequent cleaning. [175] Workstation/work surfaces shall be kept clear, other than for equipment in daily use.

DNA decontamination

98.5.11 The facility shall have a policy in place that sets out DNA anti-contamination good practice, control and management of DNA clean areas. This shall include:

a. the routine cleaning regimes for rooms, areas, equipment [176] and consumables;

b. the frequency of deep cleaning for the forensic medical examination room;

c. the access control to the DNA clean areas;

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[175] The active agent, corrosive nature and downstream effects from the cleaning materials used need to be understood; surfaces need to be resistant to degradation as a result of frequent contact with the cleaning reagents.

[176] This includes mobile equipment and consumables carried by medical practitioners on call.

d. records of the name of the cleaner, and where and when cleaning was carried out;

e. monitoring the effectiveness of the cleaning through environmental monitoring.

Cleaning reagents

98.5.12 The facility shall use cleaning products and spillage kits that have been demonstrated to be effective in removing and denaturing DNA in conjunction with appropriate cleaning procedures. These chemicals shall always be used in a manner compliant with relevant health and safety requirements.

98.5.13 The facility shall demonstrate that the cleaning product continues to be effective at removing and denaturing DNA through environmental monitoring.

Consumables including personal protective equipment/barrier clothing

98.5.14 The facility shall have a policy and procedures for the procurement, receipt and storage of reagents and consumables (including barrier clothing) that are fit for the purpose of their intended use [110] [111]. These shall also include use, handling instructions and disposal.

98.6 Examination Methods and Procedures

98.6.1 The service provider shall have documented procedures for the examination processes undertaken by the personnel at the facility. These shall include:

a. the relevant skills, knowledge and competency requirements to work with patients;

b. documenting and recording relevant information pertaining to the patient throughout the process; and

c. prior to patient's arrival at the facility – initial contact.

98.6.2 The facility shall provide accessible correct information and advice about the facility to other relevant on-site service providers and the services that are provided to potential end users (general).

98.6.3 Staff at the facility shall be able to provide basic information to patients about the:

a. options available to them for examination, treatment and advice;

b. documentation of the presence or absence of injuries;

c. importance of body fluids and the recovery of forensic science related evidence;

d. impact that actions following the incident might have on the collection of evidence;

e. requirement for an early evidence kit sample, as appropriate;

f. retention of relevant clothing worn at the time and subsequent to the incident.

98.7 Decision to undertake an examination

98.7.1 The decision to undertake a forensic medical examination shall be made by a competent forensic healthcare practitioner.

98.7.2 The forensic healthcare practitioner shall provide advice on the recovery of potential forensic science related evidence.

a. Where there is concern about child sexual abuse a professional from the Paediatric SARC should be consulted, as part of the strategy discussion, in order to determine whether the child should be examined and if so, at what time and by which practitioner(s).

b. Where it is necessary for the patient to be taken to an emergency department (or undergo an examination in other premises, for example, residential property) the forensic healthcare practitioner shall either attend and/or instruct other healthcare providers.

98.7.3 Samples shall be collected using DNA grade [110] forensic sample kit modules. Consideration of the usefulness of blood and urine samples taken at hospitals for forensic analysis shall be based on the individual case circumstances.

Attendance of the forensic healthcare practitioner

98.7.4 The forensic healthcare practitioner attending the forensic medical examination should not provide any service to custodial facilities, for example, police stations

and detention centres during that shift[177]. Where more than one patient is referred who may be involved in the same incident, or different patients are thought to be part of a linked series of cases, they should be examined in separate suites and by different healthcare practitioners. Where this is not possible, this should be documented, and an explanation provided; measures taken to minimise the potential for cross-contamination shall be documented.

98.8 Roles and responsibilities of those conducting the examination

98.8.1 Where more than one practitioner is conducting the examination, their respective roles and responsibilities shall be agreed in advance of the examination, and these should be documented.

98.9 Removal of clothing

98.9.1 The facility shall have a documented procedure for the removal, packaging and labelling of clothing to minimise contamination and the loss of evidence. The integrity of the items once packaged shall be maintained, prior to handing over to the police.

98.10 The Examination Process

98.10.1 The examination process shall be defined and documented. The process shall include:

a. the collection and documentation of relevant information;

b. the examination strategy;

c. the order of the examination activities;

d. photography; and

e. documentation and recording.

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177 Only in exceptional circumstances (for example, in very remote locations) it could become necessary to use the same forensic practitioner. In these circumstances the reason and rationale behind the decision and the steps that have been undertaken to reduce the risk of contamination shall be recorded, documented and disclosed in any subsequent report or statement provided for the CJS.

Record of attendees

98.10.2 A record of all persons in attendance at any time during the forensic medical examination shall be made. In addition to retaining this record on the patient's case notes, it shall be retained in the facility and readily accessible for contamination investigations.

98.11 Sample Collection and Handling

98.11.1 The facility shall have a documented procedure for taking appropriate forensic samples on a case-by-case basis. These shall include:

a. DNA anti-contamination good practices;

b. sample recovery good practice;

c. recording, labelling and packaging of samples; and

d. chain of evidence and sample transfer.

Storage of samples

98.11.2 The facility shall have a policy and procedures in place for the taking, storage, retention, and destruction of samples. These shall include due consideration of the Human Tissue Act 2004 [66].

Sample documentation

98.11.3 The facility shall have a procedure in place for the documentation and recording of sample collection, labelling, and the transfer and storage of samples and evidence collected.

Images

98.11.4 The facility or service provider shall have a policy and procedures in place for the electronic capture, storage and transfer of images. These shall include:

a. personnel authorised to take images;

b. the conditions required for obtaining the resolution and image quality to demonstrate the features of interest clearly;

c. recording on case notes;

d. the security and integrity of the data;

e. access to images for peer review/second opinions; and

f. disclosure of images for CJS proceedings and dealing with the information security implications.

98.12 Ensuring the Quality of Examination Procedures

Contamination Minimisation

98.12.1 The facility shall have a policy and procedures in place that minimise the possibility of contamination from the moment a patient arrives at the facility to undertake a forensic medical examination until the completion of that examination. The requirement to minimise contamination shall be balanced against the needs of the patient at every stage. Further guidance is provided in FSR-G-207 [32].

98.12.2 Although the main focus is to minimise DNA contamination, other forensic science related evidence types such as dried flaking body fluids, hairs, fibres, and particulate debris that can cross-contaminate are just as important and shall be considered within the examination and recovery procedures.

Use of Personal Protective Equipment/Barrier Clothing

98.12.3 Personal protective equipment (PPE)/barrier clothing shall be worn and changed between each patient to minimise contamination. Further guidance is provided in FSR-G-212 [109].

98.12.4 The policy and procedures for the use of PPE/barrier clothing shall as a minimum include:

a. the PPE/barrier clothing that the forensic healthcare practitioner and attendees at the medical examination shall wear;

b. the order in which to put on PPE/barrier clothing;

c. the frequency of changing PPE/barrier clothing; and

d. the disposal of PPE/barrier clothing.

DNA Elimination Samples

98.12.5 A policy and procedures shall be in place to obtain a DNA elimination sample for its inclusion on a searchable elimination database from all staff who work at

the facility prior to entering any part of the forensic examination areas of the facility. These will include (but is not limited to) forensic healthcare practitioners, paediatricians, crisis workers, and cleaning staff.

98.12.6 All other attendees entering the facility, (including the patient, whether police-referral or self-referral cases, interpreters, friends, and family) are not required to give a DNA elimination sample prior to entry but shall have their details recorded in case there is a need to request a sample at a later date for contamination elimination purposes.

98.12.7 Consideration should be given to excluding from the medical examination room any individuals who are not willing to provide their details. These policy and procedures shall take into account the requirements and guidance set out in FSR-P-302 [108] and shall include the following.

a. The taking of the DNA elimination samples.

b. Agreement/consent for sample donation from:

    i. practitioners and support staff, for example, crisis workers; and

    ii. visitors (for example, interpreters, relatives, service engineers) if a sample is required at a later date for contamination elimination purposes.

c. Security and access of information at a local/national level.

d. Secure storage and recorded transfer of samples.

e. The investigation of an identified contamination event.

f. Details of those with whom the profile will be shared.

98.13 Decontamination Measures

98.13.1 A policy and procedures shall be in place for dealing with the event that multiple patients from the same incident attend the facility at the same time.

Cleaning

98.13.2 A policy and procedures shall be in place for cleaning rooms, areas and equipment. These shall include:

a. training and authorisation of staff;

b. cleaning methods demonstrated to effectively remove/denature DNA

c. frequency of good practice cleaning and deep cleaning;

d. decontamination of re-usable equipment (ISO 15189 5.3.1.3); and

e. records of cleaning including the name of the cleaner and when.

Environmental Monitoring and Gross Contamination

98.13.3 A policy and procedures shall be in place to monitor the effectiveness of the cleaning regimes in place by monitoring the level of background DNA. These shall include:

a. an environmental monitoring sampling (EMS) programme that reflects the operational risk profile and is proportionate to the risk of transferring DNA;

b. the frequency of EMS;

c. training of personnel;

d. personnel and methodology used for collecting the environmental monitoring samples;

e. the areas and equipment to be sampled for each monitoring event;

f. DNA analysis of the environmental monitoring samples by a forensic science provider that is accredited to ISO 17025 [1] and required to provide timely processing and reporting of results;

g. advice and feedback from the forensic science provider undertaking the EMS;

h. defined follow-up processes to investigate and address gross contamination.

98.14 Documentation – Recording of Notes and Reports

Note taking and Record Keeping

98.14.1 A policy and procedures shall be in place for documenting, recording and storing information pertaining to each patient. These shall include:

a. the clarity, accuracy, legibility and permanency of notes and records;

b. detailing all activity and decisions that are directly relevant to the patient;

c. recording the notes contemporaneously;

d. recording barrier clothing/PPE worn by the forensic healthcare practitioner(s) and attendees during the medical examination;

e. identification of the forensic healthcare practitioner, and the date and time (if appropriate) of the activity;

f. amendments made to the record(s);

g. the generation of preliminary findings or final reports; [70] [71]

h. the secure retention of notes, including permanent records such as colposcope images, complying with data protection requirements; and

i. access to notes and images for second opinion, peer review, investigation and criminal justice proceedings.

Reports

98.14.2 The service provider shall have a process for the production of statements and reports in a format that takes due regard to the disclosure obligations, the requirements set out in the Criminal Procedure Rules and Criminal Practice Directions for experts. Legal obligations are set out in FSR-I-400 [21] and disclosure requirements in the Guidance for Experts on Disclosure, Unused Material and Case Management [26].

98.14.3 Forensic healthcare practitioners shall be appropriately trained and supported to produce a report that is acceptable for use within in the CJS [70], [71].

98.14.4 The facility shall define a process that can be evidenced for the end-to-end peer review stages of the case as it progresses. There should be critical conclusions check of the report/statement by a second competent individual with a suitable level of knowledge, experience and authority to perform such a review.

99. DNA Analysis

99.1 Scope

99.1.1 This section expands on the requirements for the DNA examination process specifically pertaining to the detection, recovery, analysis, interpretation, and the use of the DNA findings.

99.1.2 For DNA analysis and interpretation, the requirements are for all short tandem repeat (STR) based analyses, including related sequence technology and other chromosomal or mitochondrial DNA analyses conducted, whether performed in a conventional DNA profiling laboratory or by an alternative analysis method elsewhere.

99.2 Standards and Guidance

99.2.1 Accreditation to ISO 17025 [1] for laboratory and laboratory based activities extended to incident scenes is required; where only scene activity is conducted then accreditation ISO 17020 [2] applies.

99.2.2 To facilitate the realisation of accreditation to ISO 17025 [1] and compliance with the requirements of this Code, guidance is issued under the provisions of section 9(1) of the 2021 Act [10] and forensic units and practitioners undertaking FSA Definition – Human DNA Analysis shall have due regard to the following.

a. DNA Analysis [112];

b. Validation [33];

c. The Control and Avoidance of Contamination in Scene Examination involving DNA Evidence Recovery [31];

d. The Control and Avoidance of Contamination in Laboratory Activities involving DNA Evidence Recovery Analysis [30];

e. The Control and Avoidance of Contamination in Forensic Medical Examinations [32];

f. Allele frequency databases and reporting guidance for the DNA STR profiling in the UK [113];

g. DNA Mixture Interpretation [114];

h. Software Validation for DNA Mixture Interpretation [115];

i. Proficiency Testing Guidance for DNA Mixture Analysis and Interpretation [116].

j. Y-STR Profiling [117].

k. DNA Relationship Testing using Autosomal Short Tandem Repeats [118];

l. Methods Employing Rapid DNA Devices [119];

m. DNA contamination detection -The management and use of staff elimination DNA databases [108].

99.3 DNA Consumables

99.3.1 Consumables and reagents used for recovery and analysis of DNA shall be demonstrated to be forensic DNA grade through quality assurance testing in the form of batch testing to demonstrate successful clean production standards, or using a validated technique of post-production treatment, or both. This requirement also applies to reagents used in processes upstream from DNA processing in joint, split, or sequential cases involving other disciplines.

99.3.2 Assurance is to be provided through the use of consumables declared as compliant with PAS 377[178], 'Consumables used in the collection, preservation and processing of material for forensic analysis – Product, manufacturing and forensic kit assembly – Specification' which incorporates the requirements of ISO 18385 [110]. Consumables compliant with PAS377 negates the requirement for end user acceptance batch testing.

99.3.3 Materials used shall not have levels of DNA that can be detected by sensitive STR casework methods in use, nor leach any chemicals (for example, plasticizers) that may affect the processes used or the results obtained from the analysis.

99.3.4 Validation shall demonstrate consistency in recovery and release of DNA for sampling materials used (for example, swabs). Ongoing verification of the performance across batches shall be evidenced by quality control (QC) testing.

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[178] At of the time of writing this Code, the 2012 version of PAS 377 is being updated and will be replaced in 2022. The 2022 version of PAS 377 will be available online through the BSI website.

99.3.5 Any changes in composition of the sampling material shall be risk assessed and either validated or verified to ensure that the performance is as good as, or better than, previously validated sampling materials.

99.3.6 Post-production treatment of DNA consumables, such as ethylene oxide treatment, shall include QC for each treatment, such as DNA spiked samples placed at various locations throughout the batch to be treated, which demonstrate the required reduction level of amplifiable DNA (at least 1,000-fold) [111] [110]. Post-treatment QC testing is not required unless the QC results monitoring the efficiency of the post-production treatment fails or casts doubt on the reduction level required.

99.3.7 For consumables that cannot undergo ethylene oxide treatment, then evidence that there is no gross or systemic contamination shall be demonstrated by QC testing. The batch testing criteria is set out in PAS 377 for the batch to be considered acceptable.

99.3.8 Consumables that fail shall be embargoed and investigated further, following repeat batch testing consumables that continue to fail should be rejected for use. For consumables that have undergone postproduction treatment, such as ethylene oxide treatment, then another treatment might resolve the issue.

99.3.9 The testing shall be traceable, and the exact nature of the test and the results shall be made available to end users.

99.3.10 Areas used for the storage and handling of consumables, samples, and exhibits shall be secure and access restricted to authorised personnel only.

99.4 Packaging and General Chemicals and Materials

99.4.1 The packaging of collected material shall preserve the integrity of the potential material for forensic examination and minimise the risk of loss, degradation, or contamination.

99.4.2 Policies and procedures for handling packaging, consumables and reagents shall include:

a. areas used for the storage and handling of consumables are secure;

b. access is restricted to authorised personnel only;

c. measures are taken to protect or minimise contamination from the environment; and

d. precautions shall be taken to minimise the contamination of consumables prior to and during use.

99.4.3 Any detected or reported problems with packaging or materials already in the evidential chain will require an appropriate risk or case assessment to be undertaken and where appropriate for the material to be removed from the DNA supply chain.

99.5 Contamination Avoidance, Monitoring and Detection

99.5.1 The forensic unit shall have policies and procedures in place for contamination management. Steps shall be taken to prevent or minimise contamination between:

a. personnel and the exhibit/DNA sample;

b. contaminated consumables (for example, swabs, tubes, PPE/barrier clothing) and the exhibit/DNA sample;

c. exhibits and DNA samples; and

d. contaminated equipment and exhibit/DNA sample.

99.5.2 Steps shall be taken to ensure that appropriate precautions are taken to minimise the contamination of consumables prior to use.

99.5.3 Protective/barrier clothing shall be worn by all individuals entering crime scenes, examination, recovery, and processing areas.

99.5.4 Procedures in place shall minimise the transfer of DNA by defining when the PPE/barrier clothing shall be cleaned and/or changed.

99.5.5 To provide confidence to forensic practitioners that interpret the distribution of particular body fluids obtained from individuals in sexual offence cases and opine on activity, so as to avoid cross contamination between sites/areas sampled during the forensic medical examination of sexual assault patients then gloves shall be changed between each site/area sampled.

99.5.6 Segregation of items and the handling of items potentially in the same case shall be observed at all times, for example, scene and suspect, victim and suspect, different suspects, different locations within a scene, and multiple scenes

99.5.7 All items shall be stored in such a manner that they cannot be cross contaminated, tampered with, or stolen.

99.5.8 The forensic unit shall have policies and procedures to ensure that the cleaning chemicals and methods used are validated and shown to be effective at removing DNA.

99.5.9 Equipment shall be cleaned prior to use and according to documented standard.

99.5.10 The forensic unit shall have policies and procedures to monitor the ongoing effectiveness of cleaning, also known as environmental monitoring.

99.5.11 Anti-contamination records shall be kept, these include:

a. room access logs;

b. cleaning logs; and

c. environmental monitoring records.

99.5.12 Forensic units and practitioners shall have due regard of the guidance's on control and avoidance of contamination in scene examination [31], laboratory activities [30], and forensic medical examinations [32] issued under the provisions of section 9(1) of the 2021 Act [10].

99.5.13 The forensic unit shall have policies and procedures to ensure that access to crime scenes, examination, recovery, and processing areas is restricted to individuals covered by an adequate DNA elimination database(s). Forensic units and practitioners undertaking FSAs with the intention that the output be used in the CJS in England and Wales shall have due regard of FSR-P-302 [108] issued under the provisions of section 9(1) of the 2021 Act [10].

99.6 Selection of Methods

99.6.1 Forensic units shall use a validated method(s) for recovering body fluids and trace (touch) DNA for downstream testing.

99.6.2 Forensic units shall use a validated method(s) for the identification of body fluid material. As most body fluid identification screening tests are presumptive, the results of these tests shall be provided as an opinion.

99.6.3 Forensic units analysing DNA shall use a validated human specific quantification technique for casework samples, which is verified to demonstrate its limit of detection, limit of quantitation, accuracy, reproducibility, and measurement of uncertainty appropriate to the sensitivity of the DNA profiling service offered. Quantification of reference samples from individuals is unnecessary, as there is sufficient material for re-work.

99.6.4 Where the quantification method used is incapable of demonstrating whether polymerase chain reaction (PCR) inhibition is likely to occur due to the nature of the tested sample, then the possibility of inhibition shall be explored when an unexpected partial or no profile has been obtained.

99.6.5 In exceptional instances, where in the professional opinion of the scientist a separate quantification step normally required in a protocol is not advisable (that is, the amount of available evidential material risks the ability to obtain an interpretable profile) or not required, this shall be clearly communicated to the customer, be documented and available for disclosure purposes.

99.6.6 For rapid DNA devices, if quantification is not an integral part of the case work analytical method, then alternative means to assess and address the effects of both degradation and inhibition for each casework sample type are required as some samples are irreplaceable and samples are of variable composition, quality, and quantity.

99.6.7 Forensic units and practitioners undertaking forensic science activities with the intention that the output be used in the CJS in England and Wales shall have due regard of the ‘Methods Employing Rapid DNA Devices’ [119] guidance issued under the provisions of section 9(1) of the 2021 [10].

99.7 Validation

99.7.1 Whether it is an adopted method that has been developed and validated elsewhere or developed by the forensic unit, this Code allows for tailoring the

validation procedure through verification of the extent and scope of supporting external validation studies.

99.7.2 For DNA methods the parameters/characteristics in the validation plan shall include, as appropriate:

a. Equipment calibration/performance, reagents, reference materials, consumables;

b. Characterisation of the genetic markers (mode of inheritance, chromosomal location, detection mechanism, polymorphism);

c. Species specificity (human/non-human, targeted species);

d. Sensitivity (for example, limits of detection, quantitation and/or the range of DNA quantity that will produce reliable results with reference to stochastic effects);

e. Contamination;

f. Matrix and substrate effects;

g. Interferences and cross-sensitivities;

h. Stability (for example, to environmental and chemical factors);

i. Repeatability and reproducibility (concordance);

j. Ruggedness/robustness;

k. Performance variation between representative case-type materials;

l. Population studies (databases, independence);

m. Effect of mixtures on obtaining reliable results;

n. Precision;

o. Accuracy (measurement standards);

p. Measurement uncertainty;

q. Match criteria;

r. Amplification/PCR conditions (thermocycling parameters, concentration of primers, magnesium chloride, DNA polymerase, etc.) And preferential amplification/co-amplification; and

s. Post – Amplification/PCR treatments, electrophoresis and detection parameters.

99.8 Profile Requirement

99.8.1 The forensic unit shall demonstrate that the method can routinely achieve the 'correct profile' (reference and casework). As a minimum this includes:

a. No errors using the same profiling chemistry kit;

b. One base pair resolution;

c. Profile is not as a result of contamination;

d. Profile is not as a result of a sample or demographic switch; and

e. Discordance and mutations are identified and accounted for.

99.8.2 The forensic unit shall demonstrate that the method can obtain profiles of the appropriate quality for casework samples. As a minimum this includes optimal representation of the DNA content for:

a. Single source DNA;

b. Low template DNA;

c. DNA major/minor and equal mixtures from:

   i. Good quality DNA;

   ii. Degraded DNA; and

   iii. Mixed quality (good quality and degraded DNA).

99.8.3 Casework DNA processing and analysis forensic units shall have due regard of the 'Validation' [33] and 'Software Validation for DNA Mixture Interpretation' [115] guidance issued under the provisions of section 9(1) of the 2021 Act [10].

99.9 Quality Assurance and Quality Control

99.9.1 The quality assurance and QC measures that are to be used for the DNA analysis process are set out in 'DNA Analysis' [112] guidance issued under the provisions of section 9(1) of the 2021 Act [10].

99.9.2 QCs shall be used to provide assurance of the test and monitor the methods used from sampling to profile designation

99.9.3 For DNA profiling the QCs shall be used to monitor extraction, amplification processes, fragment sizing, sequence or profile designation and contamination.

99.9.4 A negative (blank) control shall be used from extraction to monitor contamination through the analytical process.

99.9.5 The forensic unit proficiency testing schedule shall include the processing of at least one two person and one three-person mixture DNA sample per annum.

99.9.6 Proficiency test providers and users of DNA mixture proficiency tests shall have due regard as appropriate of the 'Proficiency Testing Guidance for DNA Mixture Analysis and Interpretation' [116] guidance issued under the provisions of section 9(1) of the 2021 Act [10].

99.10 Interpretation - Profile

99.10.1 The profile interpretation method shall include consideration of:

a. allele drop-in;

b. allele drop-out;

c. gross or systemic contamination;

d. stochastic characteristics, and if used, any associated thresholds or triggers such as heterozygote balance relative to peak height, area or DNA quality/quantity;

e. stutter and artefactual peak characteristics;

f. mixture of two or more individuals covering a range of ratios per contributor, including male and female contributors;

g. determining the number of contributors;

h. methodology for reporting a single test result or replicate analyses as a likelihood ratio; and

i. forming propositions (related or unrelated individuals).

99.10.2 Forensic DNA casework processing and analysis units shall have due regard of the following guidance issued under the provisions of section 9(1) of the 2021 Act.

a. 'DNA Analysis' [112];

b. 'Allele frequency databases and reporting guidance for the DNA STR profiling in the UK' [113];

c. 'DNA Mixture Interpretation' [114];

d. 'Y-STR Profiling' [117]; and

e. 'DNA Relationship Testing using Autosomal Short Tandem Repeats' [118].

99.11 Expression of Opinion and Interpretation

99.11.1 For interpreting and reporting DNA profiles in the context of the body fluid(s) and the case circumstances, the forensic unit shall have opinions and interpretations, as set out in the United Kingdom Accreditation Service publication LAB 13 [74], included in their ISO 17025 [1] scope of accreditation.

99.12 DNA Elimination Databases

99.12.1 DNA elimination databases shall include personnel who are involved in the recovery or sampling of items, in particular all personnel associated with the DNA process chain, these include:

a. Those involved in the collection/recovery of DNA material, its analysis, and the processing environment;

b. Any personnel that have a high-risk of transferring their DNA to items or packaging, for example, personnel, who have access to exhibits and areas where these activities occur, and

c. Consumable manufacturers.

General

99.12.2 Policies and procedures for elimination databases shall include, but are not limited to:

a. data formats and data;

b. searching procedures and algorithms;

c. retention periods;

d. legacy profiles and archive;

e. sharing agreements (i.e., between laboratories/providers and with international manufacturers' elimination databases);

f. agreements/consents;

g. release forms;

h. investigation process;

i. reporting policies; and

j. additional retained information.

99.12.3 Forensic DNA profiling laboratories shall maintain local staff elimination databases and include profiles detected from batch testing reagents and negative (blank/no template) controls, and from environmental monitoring as a way of detecting contamination events as part of an integrated elimination database.

99.12.4 Profiles derived from these databases that are not identified to staff in the DNA examination process shall be shared with the national contamination elimination database and checked against relevant manufacturer staff elimination databases and international contamination databases.

99.12.5 Local and national DNA elimination database operators shall have due regard of the guidance on the management and use of staff elimination DNA databases for DNA contamination detection [108] issued under the provisions of section 9(1) of the 2021 Act [10].

Consent

99.12.6 Individuals shall provide consent or agree to the provision of a sample for the generation of a DNA profile for inclusion on one or more elimination databases for the purpose of detecting DNA contamination.

Retention periods on elimination database

99.12.7 Consideration shall be given to retention periods that are relevant to the expected routine period of time that relevant material handled by exiting staff would progress through the CJS before DNA profiles are generated from material handled by them.

99.12.8 The minimum retention period shall be 12 months, longer periods shall be considered based on:

a. The shelf life of manufactured consumables produced last by the manufacturing staff member.

b. Laboratory contamination with an 18-month interval has been observed, therefore, for DNA sampling and processing roles the more appropriate retention period is 18 months after staff have left the organisation.

c. Permanent retention to accommodate cold case reviews that tend to be decades old.

99.12.9 Any consideration for the archive and the retention period shall be determined for each elimination database or staff role, be relevant, proportionate and form part of the consent or agreement. Access and searching against any archived profiles shall be restricted.

Matches

99.12.10 All matches against DNA elimination databases shall be investigated and undertaken from a standpoint that the match has arisen due to an inadvertent contamination or other innocent circumstances.

99.12.11 All investigations shall be undertaken by nominated individuals.

99.12.12 DNA profiling providers/forensic units and manufacturers shall work together collaboratively to address the issue of contamination of consumables.

99.12.13 It is the responsibility of consumable manufacturers, forensic units including DNA profiling providers, law enforcement and forensic healthcare professionals to maintain up-to-date staff elimination DNA profile data on appropriate elimination databases. Where multiple DNA profiling providers are used then data sharing agreements shall be in place and reflected in the consent or agreement of the donor of the elimination sample.

99.12.14 Security of the elimination database records shall be maintained by enforcing restricted access to nominated authorised individuals.

99.12.15 Unsourced contaminant profiles shall be shared with international elimination databases.

Searching Against Elimination DNA Profile Records

99.12.16 All casework profiles, either single source or mixtures shall be compared against relevant elimination databases.

Match regime

99.12.17 The searching and matching regime shall optimise the identification of contaminating profiles but minimise the number of adventitious matches. The regime shall take into account:

a. the number of alleles that will be used to report a likelihood ratio to the court;

b. the minimum load criteria for the local, national, and international databases.

c. the number of elimination records held in the elimination database;

d. the discriminating power of the elimination DNA profiles held; and

e. the match stringency and N-1 routine shall be appropriate for the multiplex kit(s) used to generate the profiles being compared.

Match investigations

99.12.18 All instances where a match against an elimination database profile is observed shall be recorded as a non-conformance and be investigated.

DNA Allele Frequency and Haplotype Reference Databases

99.12.19 DNA allele frequency and haplotype (for example, mitochondria, Y chromosome) databases constructed without identifiable individuals shall be utilised as required for interpretation purposes. They shall be relevant to the issues on which an interpretation of the significance of the evidence is based.

99.12.20 Databases used for calculations shall be peer reviewed and robust. Any limitations on their use shall be documented and revealed alongside any interpretation or opinion provided.

99.12.21 Forensic units shall have due regard of the Allele frequency databases and reporting guidance for the DNA STR profiling in the UK [113] issued under the provisions of section 9(1) of the 2021 Act [10].

100. Bloodstain Pattern Analysis

100.1 Scope

100.1.1 This section relates to the classification, identification and/or interpretation and evaluation of bloodstain patterns, including bloodstain pattern analysis at incident scenes and in the laboratory and relates to the FSA Definition – Human Body Fluid Distribution Analysis.

100.2 Standards and Guidance

100.2.1 Accreditation to ISO 17025 [1] for laboratory and laboratory based activities extended to incident scenes is required; where only scene activity is conducted then accreditation ISO 17020 [2] applies.

100.2.2 To facilitate the realisation of accreditation to ISO 17025 [1] and compliance with the requirements of this Code, guidance is issued under the provisions of section 9(1) of the 2021 Act [10], and forensic units and practitioners undertaking FSA Definition – Human Body Fluid Distribution Analysis shall have due regard to this guidance provided in ‘Blood Pattern Analysis’ [120].

100.3 Terminology

100.3.1 Forensic units shall specify the terms and definitions used and any deviations or alternative phraseology shall be defined and explained in validation reports and when reporting bloodstain pattern analysis (BPA).

100.4 Personnel

100.4.1 Minimum qualifications and experience for bloodstain pattern practitioners shall be defined and documented by the forensic unit.

100.4.2 Competency requirements shall be defined

100.4.3 The forensic unit shall document the authorisation process for BPA practitioners, and this shall specify the competency level at which they are authorised to work.

100.5 Training

100.5.1 The training and ongoing professional development requirements for bloodstain pattern practitioners shall be documented for all competency levels as defined by the forensic unit.

100.5.2 The training required to develop competency shall include instruction in all facets of BPA relevant to the desired level of competency.

100.5.3 Each area of instruction shall have documented objectives and shall have a formal assessment of the trainee's knowledge and/or competency (for example, written test, practical test, PT, and/or oral test).

100.5.4 During the course of training, a BPA trainee and trainer/mentor shall document and participate in a mentorship programme.

100.5.5 A training record shall be kept for each trainee.

100.6 Competency Assessment

100.6.1 The forensic unit shall determine and document the requirements for competency and ongoing competency for each role.

100.6.2 Records of the assessment, and subsequent authorisation, shall be maintained.

100.7 Accommodation and Environmental Conditions

100.7.1 The forensic unit shall:

a. Specify conditions required for the safe handling of bloodstained items;

b. Specify procedural guidelines for best practice to preserve and avoid contamination of bloodstained items; and

c. Have access to facilities to perform fit for purpose case-specific examination and experimentation.

100.8 Selection of Test Methods

100.8.1 End-user requirements for BPA shall be described.

100.8.2 The appropriate methods and their limitations shall be specified and documented.

100.9 Validation

100.9.1 As part of validation the forensic unit shall identify the methods to be used in BPA and confirm that they are within the scope of the published scientific literature.

100.9.2 Any novel method used by the forensic unit that is not referenced in the peer-reviewed scientific literature (for example, a new software method) shall require validation.

100.9.3 Computer-assisted methods (and software used) shall be validated.

100.9.4 The forensic unit shall demonstrate that the procedures used generate consistent and valid results. This shall reflect the various aspects of BPA undertaken at the laboratory and at incident scenes.

100.10 Uncertainty of Measurement

100.10.1 A list of those methods that require an estimation of uncertainty of measurement shall be maintained.

100.11 Equipment

100.11.1 The types of equipment used for BPA and their calibration requirements shall be specified.

100.11.2 Requirements for the use and validation of software programs for BPA shall be specified.

100.12 Measurement Traceability

100.12.1 The process to create reference material comprising bloodstain patterns that are created by the forensic unit and used as working standards for bloodstain identification shall be documented. This process shall ensure that the creation of the stain patterns is witnessed and catalogued by competent practitioners.

100.12.2 The requirements for the use of pattern exemplars for interpretation shall be specified.

100.12.3 Original images shall be retained according to the forensic unit’s retention and control of data procedures and in accordance with relevant legislation.

100.13 Assuring the Quality of Test and Calibration Results

100.13.1 A procedure for an independent assessment of any bloodstain pattern interpretation, evaluation, and fulfilment of the BPA strategy by a competent practitioner shall be specified.

100.13.2 A procedure for addressing any disagreements between the practitioner and the independent reviewer shall be specified.

100.13.3 The forensic unit shall have a documented audit schedule specifying the range of blood pattern activities and practitioner roles that will be audited per annum and per accreditation cycle.

100.13.4 The forensic unit shall undertake at least one BPA PT per site per year.

100.14 Reporting Results

100.14.1 Any forensic unit specific requirements for using standardised terminology for reporting BPA shall be defined and deviations and alternative phraseology from the terminology shall be explained in reports.

101. Friction Ridge Detail: Visualisation

101.1 Scope

101.1.1 FSA Definition – Friction Ridge Detail: Visualisation and Enhancement (See section 57) can be carried out at a dedicated facility, or as a specialist activity carried out at a scene. Accreditation to ISO 17025 [1] for laboratory and laboratory based activities extended to incident scenes is required; where only scene activity is conducted then accreditation ISO 17020 [2] applies.

101.1.2 Visualisation and imaging of Friction Ridge Detail does not operate in isolation, and it shall be recognised that the activities are part of the fingerprint examination workflow.

101.1.3 It also includes activities relating to decision making prior to visualisation and post-visualisation.

101.2 Terms And Definitions

101.2.1 The term ‘friction ridge detail’ includes all areas of the friction ridge skin system on the fingers, palms, phalanges and feet (plantar).

101.2.2 For the purposes of this document, the term ‘process’ refers to the entire method/actions of recovering areas of friction ridge detail (i.e. multiple linked stages) whilst ‘technique’ refers to individual visualisation methods, for example, ninhydrin.

101.2.3 For further definitions, refer to the primary glossary in the Code (see section 109).

101.3 Personnel

Practitioner Competence

101.3.1 The forensic unit shall have competent practitioners, recognising the different areas of competence required for a range of tasks within the workflow, and shall implement a training and competency programme to ensure the continual development of its practitioners.

101.3.2 The forensic unit shall establish a competency framework for all laboratory practitioners using criteria that have been established by the level of practitioner competence required for each job role.

101.3.3 This framework shall include the ongoing process of training, assessment, and review to ensure the maintenance of practitioner competence. It shall define when competence has lapsed and the process for managing an individual whose competence has lapsed.

Initial and Ongoing Competence

101.3.4 The details of a structured training programme to attain initial competence and a programme of periodic assessment to demonstrate ongoing competence shall be documented.

101.3.5 Training and on-going competence assessment shall be determined and documented by the forensic unit and shall include:

a. aspects of technique selection;

b. aspects of technique application;

c. recognition of technique performance issues;

d. appreciation and accommodation of requirements of colleagues further along the workflow;

e. an understanding of image capture techniques, including:

i. an appreciation of image quality;

ii. basic principles of photography; and

iii. post capture image enhancement

101.4 Technical Records

101.4.1 The forensic unit shall have procedures for the production of and the recording of changes to technical records; records may include photographs, images, hard copy or electronic records of any documentation.

101.4.2 Documented procedures shall define and reference the documentation (also referred to as case notes) associated with the friction ridge detail visualisation process and image capture.

101.4.3 Any necessary deviation in the application of a process, such as to take into account environmental change at an incident scene, shall be documented with documentation to include the reasoning behind the decision made.

101.4.4 If it becomes apparent that a previously rare event, such as the use of specialist techniques or particular conditions, becomes more common place, then accreditation shall be sought.

101.4.5 The level of detail in the documentation shall be sufficient to allow for an audit trail.

101.4.6 The forensic unit shall have procedures that document:

a. the actions a practitioner should take to record the results of a process; and

b. the actions a practitioner should take to recover the friction ridge detail for subsequent downstream processing.

101.5 Accommodation and Environmental Conditions

101.5.1 The facilities shall be appropriate for the safe and effective implementation of the friction ridge detail visualisation techniques used within that facility.

101.5.2 The forensic unit shall have at least the following.

a. Space for managing items submitted for friction ridge detail evidence recovery, including secure storage and handling areas.

b. Areas for carrying out the processes including:

i. dedicated areas for the optical techniques; and

ii. ‘wet’ and ‘dry’ areas for the preparation of chemical and physical techniques.

c. Installed fixed equipment, for example, fume cupboards, wet benches.

d. A range of general equipment, for example, measuring equipment.

e. Specific equipment used to capture friction ridge detail for subsequent search and comparison purposes that have been demonstrated as fit for the required purpose.

f. Suitable storage for equipment and chemical products.

g. Controlled areas of access, for example, where there are health and safety precautions required to operate a technique or where secure areas of restricted access are required.

101.6 Test Methods and Method Validation

101.6.1 The forensic unit shall demonstrate knowledge and understanding of the requirements for validation, and the validation of their processes for friction ridge detail visualisation and the subsequent image capture and transmission process.

101.6.2 Validation shall be undertaken by the forensic unit using known source data, to ensure the reliability of examination outcomes.

101.6.3 Practitioners shall understand their data, limitations of their data, and the relevance of their findings based on the validation of their methods and processes.

101.6.4 The information provided in this section is supplementary to the validation guidance provided in this Code.

a. Processes and techniques described within the Fingermark Visualisation Manual have varying amounts of testing and data supporting their use. Forensic units shall review this data and ensure that it is sufficient to support the methods as used in their operational work. The Defence Science and Technology Laboratory (Dstl) has made documents available including the Fingerprint Source Book in order to assist with determining whether the Fingermark Visualisation Manual validation data is sufficient for operational activities.

b. Validation shall be undertaken in all cases where the forensic unit deviates from previously tested techniques and processes or wish to use a different treatment method/route they believe to be more effective from that set out within the Fingermark Visualisation Manual. Validation studies should evaluate the performance of new or altered techniques, sequences, and procedures against current methods in order to assess suitability for potential operational use, and they should be planned with reference to published guidelines and the Fingermark Visualisation Manual.

c. The forensic unit shall ensure that where external validation studies have been used, for example, scientific journal publication, Fingermark Visualisation Manual, Fingerprint Source Book, these have been reviewed by the forensic unit and the strengths, weaknesses and any limitations are fully understood and addressed in-house to confirm suitability by verification.

d. If a technique is to be used on a substrate not tested within the validation plan, a competent practitioner shall determine if additional validation data is required. For example, the evaluation could be based upon the similarity of the substrate (porosity, colour, texture) to those previously tested. The decision to conduct or not conduct further studies or to extend the scope of an existing study shall be documented with an appropriate rationale.

101.6.5 The forensic unit shall hold documentation for each validation and/or verification exercise that it completes.

101.6.6 The forensic unit shall determine whether measures aimed at preventing contamination or cross-contamination are fit for purpose.

101.7 Image Capture and Transmission

101.7.1 Image capture shall be carried out by competent practitioners.

101.7.2 Imaging should be optimised prior to capture by using appropriate lighting, camera settings and optics rather than by post-capture image processing which may cause some of the original friction ridge detail to be lost.

101.7.3 The image capture and transmission process shall be validated or verified, and performance tests carried out to ensure the various elements within this process do not adversely affect the quality of the result for examination of friction ridge detail.

101.8 Estimation of Uncertainty of Measurement

101.8.1 The forensic unit shall identify the components of uncertainty and minimise their effect, as far as possible through:

a. The specification of equipment, chemicals, and consumables;

b. Anti-contamination procedures;

c. Staff training;

d. The practical validation or verification of methods;

e. The selection of appropriate recovery techniques for the case circumstances; and

f. Image capture methods.

101.8.2 Control Of Data Procedures shall be in place to protect and secure both the paper and electronic data generated by the Forensic Unit.

101.8.3 Policies and procedures shall be in place for the digital capture, storage, retrieval, display, transmission, retention, and necessary destruction of images.

101.8.4 An audit trail shall be created at receipt and maintained with the image(s). The original image shall be retained securely, and any image processing and enhancement shall be carried out on a duplicate.

101.8.5 The Forensic Unit shall specify the responsibility for the handling of images provided through a third party.

101.9 Measurement Traceability

101.9.1 The Forensic Unit shall have traceable records to demonstrate that the calibration of equipment has been completed and reviewed and to confirm that it is fit for purpose.

101.9.2 The Forensic Unit shall produce evidence of continuing compliance of identified laboratory equipment through a schedule of re-calibration.

101.9.3 The Forensic Unit shall maintain records that ensure any calibration or reference standards are traceable, for example, to an international system of units (SI).

101.10 Sampling

101.10.1 Sampling in this context relates to a case assessment leading to the selection of appropriate items (whole or part exhibits) and targeting specific friction ridge detail recovery processes to facilitate the expedient disclosure of results based on the needs of the investigation.

101.10.2 The sampling of items or exhibits required in the friction ridge detail retrieval process may be determined prior to the submission of items to the Forensic Unit. This may be documented within a standard operating procedure determined by the Forensic Unit, such as a submission policy or a service level agreement (SLA).

101.10.3 When the Forensic Unit needs to sample items within an exhibit, or within a submission that deviates from the documented sampling policy or agreed customer service agreement, the sampling strategy shall be agreed with the relevant parties and shall be clearly documented.

101.10.4 Where only a sample of the developed friction ridge detail is progressed to the comparison and/or search processes, it shall be documented either:

a. as part of the organisational procedures;

b. in a policy document; or

c. on a case by case basis and made clearly evident for disclosure.

101.11 Handling of Items

101.11.1 The origin of individual exhibits shall be traceable at all times during the process and an audit trail shall be available to track the continuity of all case-related items.

101.11.2 Unique labelling shall be in place to distinguish between exhibits where this is required.

101.11.3 Handling of exhibits shall be kept to a minimum and exhibits shall be packaged in such a way to minimise damage caused by contact between the exhibit and packaging.

101.12 Assuring the Quality of Results

101.12.1 Where accidental contamination of an exhibit may have taken place, the practitioner shall inform the relevant personnel (usually the fingerprint bureau) so that the practitioner's elimination prints can be checked against any friction ridge detail obtained for that exhibit.

101.12.2 The Forensic Unit shall have in place documented procedures for quality assuring any friction ridge detail submitted for comparison or search, whether the product is recorded digitally or manually.

101.12.3 Where a technique has been applied, the Forensic Unit shall provide documentation and evidence to demonstrate whether it has worked satisfactorily. Test strips or control samples shall be appropriate to the technique and the required result to add value to the quality assurance process.

101.12.4 Where a Forensic Unit uses filtering or vetting criteria, there shall be procedures in place to monitor the practitioner's adherence to the vetting criteria.

101.12.5 The Forensic Unit shall devise a proportional and representative schedule of dip sampling of case files by a competent practitioner. This shall include cases where friction ridge detail has been recovered and cases where the techniques utilised have not produced any friction ridge detail, or where the friction ridge detail has not been recovered by a practitioner for comparison and/or search purposes.

101.12.6 The Forensic Unit shall participate in suitable proficiency test (PT) programmes and/or inter-laboratory comparisons (ILC). A plan for the level and frequency of

participation, and a process for the review of the resulting outcomes, shall be documented.

101.12.7 Process performance shall be continuously reviewed using data from dip sampling, quality control, and competency and proficiency tests.

101.13 Reporting The Results

General

101.13.1 The outcomes of any visualisation techniques shall be recorded. All processes applied and examinations carried out shall be documented, irrespective of the result.

101.13.2 The Forensic Unit shall have competent practitioner(s) capable of providing supporting information (technical and observed) to end user(s) who are required to make informed decisions or formulate opinion(s) about the deposition of the developed mark. Images that show the relative position of the marks in situ on the exhibit shall be provided as required (and include images in technical records).

101.13.3 The results shall be updated/recorded on any organisational management system in use or communicated direct to the customer. This communication shall be retrievable if needed.

Communication and Collaborative Working

101.13.4 The Forensic Unit shall have documented strategies, demonstrable as effective for communication and collaborative working, both as part of the overall fingerprint workflow and where multiple evidence types are required.

102. Friction Ridge Detail: Comparison

102.1 Scope

102.1.1 This appendix covers: identity confirmation; evidence processing; comparison of friction ridge detail; case documentation; report writing and communication.

102.1.2 The Forensic Unit shall recognise that friction ridge detail analysis and comparison activities are one part of the fingerprint examination end to end

workflow (recovery to final report) and are reliant on the quality of the product from upstream processes.

102.2 Collaborative Working and Communication

102.2.1 Procedures shall cover the provision of guidance and feedback to the fingermark recovery and fingermark visualisation practitioners based on the quality of the submissions received, this might include what and how to prepare the friction ridge detail (lift, photograph or digital image) for subsequent processing.

102.3 Personnel

Practitioner Competence

102.3.1 The Forensic Unit shall have competent practitioners, recognising the different areas of competence required for a range of tasks within the workflow, and shall establish a competency assessment framework for new (including those with previous experience) and existing fingerprint practitioners. This framework shall include:

a. The ongoing process of training, assessment and review to ensure the maintenance of practitioner competence;

b. The process for managing and supporting individuals whose competence has lapsed.

102.3.2 The details of a structured training programme to attain initial competence and a programme of assessment to demonstrate ongoing competence shall be documented.

102.3.3 Competency assessment shall include manual and/or computer-based comparisons and the use of any Automated Fingerprint Identification System (AFIS). Assessment of initial and on-going competence shall be objective and therefore include items of known outcomes from finger, palm, and planter, for example, from ground truth data.

102.3.4 Competence assessment (initial and on-going) shall include demonstration of the ability to appropriately achieve optimal optical performance.

102.3.5 The Forensic Unit shall provide feedback on the quality of friction ridge detail submitted from scene and laboratory practitioners as well as other organisations that are unsuitable for comparison. The information shall be used as part of developing and monitoring practitioner decision making competence for identifying suitable friction ridge detail (vetting) for comparison purposes.

102.4 Technical Records

102.4.1 The Forensic Unit shall have procedures for the production of technical records, including recording examination notes contemporaneously in a format and with a level of detail that is clear and auditable.

102.4.2 Procedures shall define and reference the documentation (also referred to as case notes) associated with the fingerprint examination process.

102.4.3 All records shall include the date they were made and the identity of the person responsible for each entry. Technical records shall as a minimum demonstrate the examination sequence and include:

a. A unique reference number;

b. Records of materials used in course of examination;

c. Records of the examination;

d. The sequence of recording contemporaneous notes;

e. Results/outputs;

f. The reporting outcomes of the fingerprint examinations; and

g. Records of communication.

102.5 Accommodation and Environmental Conditions

102.5.1 The workspace and equipment used for fingerprint comparison shall be fit for the practitioner's needs and conducive to fingerprint examination. This should include, but not be limited to:

a. Good ergonomic design to meet the individual practitioner's physical needs;

b. Suitable lighting with areas with access to natural light sources;

c. Adjustable working temperature throughout the year;

d. Height adjustable work benches; and

e. Fit-for-purpose chairs and stools.

Equipment

102.5.2 The requirements for computers and automated equipment are set out in the Code.

102.5.3 The Forensic Unit shall have procedures for the control, maintenance, calibration, and performance checking of critical equipment, such as printers, screens, and rulers.

102.5.4 Suitable means shall be available to improve magnification/resolution to ensure that the combination of the practitioner and the equipment is such that it optimises optical performance. Tests shall be undertaken to demonstrate that appropriate optical performance can be achieved.

102.5.5 Maintenance, calibration, and performance checks shall be recorded.

102.6 Test Methods and Method Validation

General considerations

102.6.1 The Forensic Unit shall have documented procedures describing the activities it undertakes, including manual and/or computer based comparison and how it uses any AFIS within its workflow.

102.6.2 The fingerprint examination process used in relation to friction ridge detail shall consist of the stages referred to as Analysis, Comparison and Evaluation (ACE).

102.6.3 ACE can be followed by a Verification stage (ACE-V). This process provides a structure for the verification of fingerprint examination results. Verification is a review of the original conclusion and the examination records made by another practitioner using the examination process.

102.6.4 The process for verification of complex (challenging) comparisons shall also be documented in the Forensic Unit's procedures.

102.6.5 Verification can be blind or open and the circumstances where these options are used shall be clearly defined in the Forensic Unit's procedures.

102.6.6 The Forensic Unit shall clearly define and document a procedure for the management of circumstances where a variance in practitioner opinion has arisen.

Use of Automated Fingerprint Identification System in friction ridge detail examination

102.6.7 Where an AFIS is used for comparison activities (one to many and/or one to one) the Forensic Unit shall understand the operation and limitations of the system in their workflow and shall:

a. Understand the model/basis of the search method employed;

b. Understand the performance of friction ridge detail auto encode function of the system against manual encoding by competent practitioners;

c. Understand the efficiency (i.e. success rate) of the search method to return the appropriate respondent lists (i.e. true positive);

d. Understand the type (quality/sufficiency) of friction ridge detail where the appropriate respondent is not returned from one to many searches (i.e. false negative);

e. Determine the re-launch strategies (manual and/or automated) for negative outcomes to address the incidence of false negative outputs;

f. Determine the optimum number of respondents for conducting manual comparisons to minimise the risk of not identifying the appropriate candidate; and

g. Process all identifications that result from an AFIS search in accordance with the established verification procedures. On-screen verification is acceptable providing that a documented audit trail is available.

102.7 Validation

102.7.1 The Forensic Unit shall demonstrate competency in, and understanding of, the requirements for validating its processes for friction ridge detail analysis and comparison. This will be evidenced through the design and development of its validation plan and completion of an appropriate validation with further validation and/or periodic validation review as required.

102.7.2 Validation shall be undertaken by the Forensic Unit to ensure the reliability of reported outcomes.

102.7.3 The validation exercise shall incorporate known source friction ridge detail. In addition to the process detailed in the Code, it shall include:

a. All friction ridge detail typically encountered, including varying quality and marks enhanced using typically encountered treatments/processes;

b. Procedures to ensure that the system delivers expected results;

c. Some form of measure of uncertainty/known error rate; and

d. Determination of the performance and limitations of the visual examination and magnification used for analysis and comparison.

e. Where the fingerprint comparison relies on a digital image with no hard copy original image the integrity of image quality and definition should be understood and demonstrated through appropriate validation.

102.7.4 Where an AFIS is used the Forensic Unit shall either validate or verify the performance by using ground truth data using the full range of friction ridge detail encountered in casework.

102.7.5 The method used for the electronic capture, storage and transfer of fingerprint images shall be validated including appropriate calibration.

102.8 Estimation of Uncertainty of Measurement

102.8.1 Procedures shall be put in place to establish the uncertainty of a given process. Error rates can be determined initially from the validation of the methods and processes to assess consistency and variances of opinion.

102.8.2 The uncertainty of measurement shall be periodically reviewed using data from dip sampling, quality control, and competency and proficiency tests.

102.9 Control Of Data

102.9.1 Procedures shall be in place to protect, secure, control, review and retain the data generated by the Forensic Unit, these may relate to:

a. case management systems;

b. the AFIS;

c. digital image transfer and storage systems; and

d. digital comparison software.

102.9.2 Policies and procedures shall be in place for the digital capture, storage, retrieval, display, and transmission of images used as evidence. The method(s) used shall maintain the identity, security, and integrity of the data.

102.9.3 An audit trail shall be created at receipt and maintained with the image(s). The original image shall be retained securely, and any image processing and enhancement shall be carried out on a duplicate.

102.10 Sampling

102.10.1 Sampling in this context relates to case assessment leading to the appropriate selection and targeting of comparisons to facilitate rapid disclosure of results based on the needs of the investigation.

102.10.2 The criteria for the selection of the friction ridge detail shall be determined by the relevance of the exhibit and consideration given to the quality of the friction ridge detail. This shall be recorded within the contemporaneous notes.

102.10.3 If any friction ridge detail is not subject to analysis the reason for this shall be documented.

102.11 Handling of Test Items

102.11.1 The Forensic Unit shall have documented procedures for quality assuring any items received for comparison or search.

102.11.2 Procedures detailing the storage and preservation of friction ridge detail shall be documented.

102.11.3 Exhibits shall be securely sealed where required and continuity recorded. If marks are electronically transmitted to fingerprint Forensic Units, the digital capture and transmission device shall ensure that all movements and enhancements are recorded and available for audit should the need arise.

102.11.4 An audit trail shall be available to track the continuity of all case-related items.

102.12 Assuring The Quality of Test Results

102.12.1 Forensic Units shall have documented procedures for verification that will manage the process of checking critical findings for friction ridge detail examination.

102.12.2 Blind verification forms part of the risk management approach adopted to mitigate risks associated with cognitive bias.

102.12.3 Forensic Units shall participate in suitable inter-laboratory comparisons (ILC), collaborative exercises and/or proficiency test (PT) programmes. A plan for the level and frequency of participation, and the resulting outcomes, shall be documented.

102.12.4 The Forensic Unit shall determine a process for monitoring the systems (including AFIS) and processes used in their friction ridge detail analysis and comparison outcomes. This shall also include cases where the friction ridge detail has not progressed to comparison and where nominated candidates have been excluded as the source of the friction ridge detail.

Control of Non-Conforming Testing Work

102.12.5 The Forensic Unit shall have a process for monitoring to identify trends and issues amongst examiners.

102.12.6 The Forensic Unit shall have a policy and procedure to deal with differences of opinion amongst examiners.

102.12.7 An error should not be confused with a difference of opinion. When an error has been established, either technical or administrative, a non-conformance shall be raised.

102.13 Reporting The Results

Reporting outcomes

102.13.1 The comparison of fingerprints is a cognitive process that relies on the competence of the practitioners to perform examinations and form conclusions based on their findings. The conclusions drawn shall be made based on their skill and experience; however, the basis for these conclusions shall be traceable and clearly evidenced.

102.13.2 Regardless of the certainty in the mind of a fingerprint practitioner once a conclusion is reached, the evidence presented shall be considered as an opinion, not a statement of fact.

102.13.3 Any report or statement shall disclose whether practitioners involved in the examination are in disagreement with the reporting outcome.

102.13.4 Differences of opinion in the reporting outcomes shall be noted and documented in the case file and disclosed.

102.13.5 The test method (ACE-V) will deliver one of the following outcomes:

a. Identified; A practitioner term used to describe the mark as being attributed to a particular individual/person. There is sufficient quality and quantity of ridge flow, ridge characteristics and/or detail in agreement with no unexplainable differences that in the opinion of the practitioner two areas of friction ridge detail were made by the same person.

b. Excluded; There are sufficient features in disagreement to conclude that two areas of friction ridge impressions did not originate from the same person

c. Insufficient; The ridge flow and/or ridge characteristics revealed in the area of friction ridge detail (mark) are of such low quantity and/or poor quality that a reliable comparison cannot be made. The area of ridge detail contains insufficient clarity of ridges and characteristics or has been severely compromised by extraneous forces (for example, superimposition, movement) to render the detail present as unreliable and not suitable to proffer any other decision

d. Inconclusive; The determination that the level of agreement and/or disagreement is such that it is not possible either to conclude that the areas of friction ridge detail originated from the same donor, or to exclude the particular individual as a source for the unknown impression/mark.

102.13.6 When reporting an inconclusive outcome an explanation as to why the outcome is inconclusive should be given.

102.13.7 The Forensic Unit shall meet the requirements of LAB 13 [74] in relation to the provision of opinions and interpretations related to friction ridge detail comparison and have this included in their ISO 17025 [1] scope of accreditation.

102.13.8 The Forensic Unit shall have policy that clearly defines the process for the provision, amendment, and retention of both written and verbal reports.

102.13.9 Where reports contain opinions that rely on results obtained from data or tests performed by the fingermark enhancement laboratory these shall be recorded.

102.13.10 Forensic Units shall recognise that practitioners may be influenced in their decisions by contextual information. Processes and procedures shall be put in place to safeguard against the risk of cognitive bias and influence. Such processes could include, but not necessarily be limited to:

a. The use of blind verification; and

b. Awareness training proportional to:

i. The level of responsibility; and

ii. The degree of exposure to situations that may be prone to bias.

102.13.11 All reports of the examination results that are produced shall be subject to a defined quality check, including critical findings review of the examination prior to being communicated to the recipient. If there is a need to provide results prior to the production of this quality checked final report, for example, then the provisional status of the results shall be made clear to the recipient through the use of appropriate caveats.

102.13.12 Legal obligations are set out FSR-I-400 [21] and disclosure requirements in the CPS Guidance for Experts on Disclosure, Unused Material and Case Management. The requirements for expert and non-expert statements are set out in FSR-G-200 [70] and FSR-G-225 [71] respectively. The Regulator will also publish a guidance document on terminology in fingerprint comparison.

103. The Analysis and Reporting of Forensic Specimens for s5A of the Road Traffic Act 1988

103.1 Scope

103.1.1 This section is published by the Regulator to establish the requirements for, and a common approach to, the analysis and reporting of the concentrations of certain drugs in relation to offences under s5A Road Traffic Act 1988 (drug driving) [92].

103.1.2 This document applies to analysis of whole blood [179] samples in relation to the FSA Definition – Toxicology: Analysis for Drugs in Relation to s5A of the Road Traffic Act 1988.

103.2 Provisions

Home Office Specification

103.2.1 The Home Office, in conjunction with the Department for Transport, issued a specification for the analysis of blood in relation to s5A [92] when it is undertaken at the instruction of the police or prosecuting authorities in England and Wales. This section does not replace or detract from the specification in relation to work done in England and Wales.

Terminology

103.2.2 The analytical method is required to report the concentration of a drug in a sample as the mean of the result of a number of analyses. To ensure clarity the term ‘standard deviation’ shall mean the standard deviation derived using the results of the individual analyses or on the basis of reporting individual analyses. The term ‘standard deviation of the mean’ (SDM) shall mean the standard deviation calculated using the mean of the results of multiple analyses as the reported result for a sample or on the basis that the reported result will be the mean of multiple analyses. In some texts the SDM is referred to as the ‘standard error’ or the ‘standard error of the mean’.

Sample Storage

103.2.3 The drugs covered by the s5A [92] offence may be subject to degradation over time. The forensic unit shall use storage methods which demonstrably minimise such degradation.

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[179] Although s5A Road Traffic Act 1988 [92] refers to both blood and urine the Regulations [95] made under the Act only set limits for blood. As a consequence, this section has been drafted to deal only with the analysis of blood.

103.2.4 The forensic unit should consider the storage of samples prior to submission and may advise whether analysis is likely to be worthwhile; and may provide customers with advice as to how to store samples to maintain their integrity for analysis.

Requirements for Analysis

103.2.5 Any forensic unit undertaking analysis of whole blood where the results may be used for a prosecution under s5A Road Traffic Act 1988 [92] shall meet the following requirements.

103.2.6 The forensic unit should consider the guidance [121] on general forensic toxicology issued by the United Kingdom and Ireland Association of Forensic Toxicologists (UKIAFT) in developing analytical processes. Compliance with this guidance is not mandatory and its contents do not override the requirements of this Code or the relevant accreditation body.

Environmental Requirements

103.2.7 The following environmental requirements shall be addressed.

a. Analysis for the purpose of s5A [92] shall be conducted separately from work involving bulk drugs. This means that bulk drug cases shall not be conducted in the same laboratory or analytical batch as s5A [92] analysis.

b. Analysis of samples for the purpose of s5A [92] casework shall be conducted separately, in terms of both space and analytical batch, from batches of other toxicological case work (other than s5A or s4 [92]) that may contain high levels of drugs (for example suspected overdose cases in post mortem casework). Separation may be achieved by management of space employed to ensure the risk of contamination is minimised by separating work in time and carrying out appropriate environmental checks.

c. Environmental monitoring shall be conducted to determine the presence and approximate level of any drugs being tested for in relation to s5A [92] in the laboratory in which the sample preparation and analysis are undertaken, in particular for cocaine, amphetamine and methylamphetamine. This should include the use of the matrix blank samples. The appearance of a drug in a sample (e.g. QC sample or blank) where that drug should not have been

present will also be monitored. The presence of a drug in a solvent blank where that drug was present in the case sample analysed immediately before the solvent blank will be taken to be the result of carry over as opposed to contamination.

d. The data produced by environmental monitoring shall be reviewed to ensure the level, if any, of drugs in the environment is managed.

Analytical Requirements

103.2.8 The analytical method shall, for each drug the laboratory analyses in relation to a potential s5A [92] offence, achieve the following requirements.

a. The analysis shall be sufficiently specific for each drug such that the results can be relied on as measuring the concentration of the drug.

b. The analytical method shall ensure the results can be attributed to the sample from which they are believed to come from. This will include procedures to ensure traceability as well as address the potential for carry over.

c. To protect against the risk of carry over a solvent blank shall, subject to the following point, be run before each case sample and the results from this blank shall not show the presence of any relevant drugs. This requirement will not require a solvent blank between two case samples where they are aliquots from the same case sample.

d. The forensic unit shall have a policy on the nature and frequency of the calibration of the method to ensure the results are robust.

e. For any part of the analysis employing a chromatographic method the forensic unit:

i. Shall ensure that QCs are extracted and analysed alongside the case samples which will form the batch to check that the instrument calibration is still valid;

ii. Shall ensure that data points generated from calibrators are only omitted from the generation of the ‘calibration curve’ in exceptional circumstances and if this is allowed by an in-house policy on identification of ‘outliers’ which complies with UKAS LAB 51 [122];

iii. Shall ensure any omission of calibration data from the generation of the ‘calibration curve’ is justified and recorded;

iv. Shall have requirements for an acceptable ‘calibration curve’ which implement the requirements of UKAS LAB 51 [122];

v. Shall ensure manual integration of peaks is only undertaken as allowed by an in-house policy, which is scientifically justified and applied consistently through a batch; [180]

vi. Shall ensure manual integration of peaks is recorded and justified; and

vii. Where manual integration has been used on a case sample and this has caused the result to be reported as over the legal limit, where this would not have happened without the use of manual integration, this must be made clear when the results are reported.

f. For any part of the analysis employing a mass spectroscopic method the forensic unit shall have a policy on the acceptable ion ratios in calibrators, QC and case samples.

i. This policy should, subject to the point below, be based on the guidelines [123] issued by World Anti-Doping Agency (WADA).

ii. The forensic unit may have an in-house policy setting out the acceptable results for peaks above the ULOQ which deviates from the WADA guidance [123].

g. Subject to 103.2.24 below, a blank human blood sample (which is analysed through the whole extraction alongside case work) must be run on each analytical batch. For each drug being analysed the concentration must be less than the LOD. [181]

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[180] Manual integration of a peak shall not be undertaken solely to ensure an MRM ratio passes or to improve the calibration curve (i.e. R2 value).

[181] Forensic units may wish to consider the use of blank composed of a blood samples ‘spiked’ with the internal standard as well.

h. The method shall involve monitoring for analytical results which suggest there may have been a contamination event (e.g. the presence of cocaine without BZE or drugs appearing where not expected).

i. The reported result of the method [182] shall be the mean of the analysis of at least two aliquots from the sample. There shall be at least two results generated from separate extraction (i.e. the extraction of at least two aliquots) and analysis of aliquots taken from the sample. This requirement applies to case samples and those QC samples at the relevant legal limits.

j. For the mean of a number of analytical results to be acceptable all of the analytical results (i.e. drug concentrations in any case sample, calibrator or QC) shall be in the range ±20% of the mean. [183] Forensic units may adopt alternative approaches so long as they do not allow a greater difference from the mean.

k. For each drug the analytical method shall achieve the following.

   i. It shall have a lower limit of quantification (LLOQ) at a concentration equal to or lower than half of the legal limit.

   ii. It shall, subject to point iii immediately below, have an upper limit of quantification (ULOQ) at a concentration at least 25% higher than the Common Reporting Threshold (CRT) (see below).

   iii. For Diazepam, Flunitrazepam, Lorazepam, Oxazepam and Temazepam (where the sample and QCs may require dilution to bring them within the calibration range) the forensic unit shall have a ULOQ appropriate to the method used.

   iv. It shall use data points for calibration which ensure the calibration curve is optimised over the range of interest (that being from the LLOQ to the ULOQ).

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182 The term “reported result of the method” shall be used to refer to the final output of the analytical method (normally the mean of a number of analyses) which will be used to calculate the “not less than” figure.

183 The use of a ±20% check is a safeguard based on current practice. Given the uncertainty of measurement of the methods the fact that two analytical results are >20% from the mean does not, by itself, indicate any problem with the analysis.

v. The acceptable range of recovery of the internal standard shall be determined. During the validation of the method the forensic unit shall determine the range of recovery of the internal standard (as applied on a batch basis) over which the method is reliable and, in particular, over which the uncertainty of measurement requirements in this document can be achieved.

vi. It shall have a relative bias (the correct term may be trueness but the term bias is routinely used in the field) of less than 20%. [184] [185]

vii. It shall have the bias monitored on a regular basis (that being at least every three months).

viii. The method shall, subject to 103.2.10, ensure the correction of any positive bias, but negative bias shall not be corrected. [186]

l. The forensic unit shall be able to achieve the uncertainty of measurement requirements set out in 103.3.19 and 103.3.22 below. These requirements shall be maintained in routine work.

103.2.9 The forensic unit shall, for each drug, establish the uncertainty of measurement in a manner consistent with accepted guidance [39] [124] and accounting for all variables which may affect the results (e.g. different operators, analysis in different batches, analysis on different dates).

103.2.10 If a forensic unit has an uncertainty of measurement which is lower than the Forensic Science Regulator Expanded Uncertainty (FSREU) and the correction for bias and deduction of the forensic unit's uncertainty of measurement would lead to a 'Not Less than Figure' (NLTF) equal to or higher than that created by deducting the FSREU there shall be no correction for bias.

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184 The bias of the method cannot be determined from a single batch so the bias shall be determined as part of the validation or specific study.

185 There are approaches to dealing with bias which allow it to be addressed as part of the determination of the uncertainty of measurement.

186 In normal analytical methods bias would be corrected regardless of whether it was positive or negative. In this area correction of negative bias would involve increasing the analytical results which is not considered appropriate.

Positive Quality Control

103.2.11 The forensic unit shall undertake ongoing quality control monitoring using, subject to 103.2.24 below, human blood spiked at the critical drug driving limits for each drug. The results shall be trended in an appropriate manner (which is a Shewhart Chart) and subjected to suitable statistical rules (e.g. the Westgard Rules [125]) for action. Results shall only be reported as valid if obtained while the method is under control.

103.2.12 The quality control monitoring shall use sufficient QC samples, at suitable concentrations, in each batch to ensure the reliability of results can be assured. Forensic units should use a level of QC samples of at least 5% of the samples in the batch.

103.2.13 To be considered reliable each casework must be 'bracketed' by acceptable QC results. To be acceptable the QC samples before and after the sample (with concentrations above and below the analytical results for the case sample – where these exist) are valid.

103.2.14 The quality control matrix will, subject to 103.2.24 below, use human blood. The drugs will be spiked into this matrix at the legal limits for each drug.

103.2.15 The quality control data shall be plotted on a Shewhart chart with statistically derived control limits. The standard deviation or standard deviation of the mean used for the control lines will be derived from statistical analysis of QC data (a minimum of 20 data points, excluding outliers) for set up of preliminary quality control chart limit monitoring purposes.

103.2.16 The control lines for the warning limits shall be derived using the mean of the QC data and:

a. Where the QC results are plotted as individual analytical results; ±2 standard deviations of the forensic unit's method; or

b. Where the QC results are plotted as the mean of analytical results ±2 standard deviations of the mean of the forensic unit's method.

103.2.17 The control lines for the action limit shall be derived from the mean of the QC data and:

a. Where the QC results are plotted as individual analytical results; ±3 standard deviations of the forensic unit's method; or

b. Where the QC results are plotted as the mean of analytical results; ±3 standard deviations of the mean of the forensic unit's method.

103.2.18 An appropriate investigation, the nature of which is to be determined by the forensic unit, shall be carried out and corrective action taken, where relevant, when any 1 point exceeds the action limit.

103.2.19 An appropriate investigation, the nature of which is to be determined by the forensic unit, shall be carried out (or comment made on the case file if not detrimental to the CJS) and corrective action taken when 2 consecutive points are between the warning and the action limits.

103.2.20 The forensic unit shall establish rules for the monitoring of trends in the QC data (for example, an appropriate investigation to be carried out when 9 consecutive points fall on one side of the mean, 6 consecutive increasing points, or 6 consecutive decreasing points).

103.2.21 The forensic unit shall review the QC data and re-establish the mean, warning, and action limits from the QC data once 60 data points have been obtained to set up initial limits.[187] The data on the charts shall be reviewed thereafter at intervals of no more than three months and the data on the charts statistically compared to that data used to establish these initial limits. Where there is a statistically significant difference,[188] or other reason such as a new QC standard being used or the instrument requiring cleaning (other than as part of routine calibration and maintenance), between the latest set of QC data and the initial set of data, the limits shall be reset. The new values shall apply only to analyses after resetting of the values.

103.2.22 Where the monitoring indicates the laboratory is no longer complying with the requirements in relation to uncertainty (see 103.2.8) work shall stop. A non-

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187 This means that the preliminary values established at the point of validation shall be reviewed and updated in light of casework use.

188 This would typically be done by using F [precision] and Student's t [bias] statistical tests.

conforming work investigation shall be carried out and corrective action shall be taken to return the method to control.

103.2.23 Where a new lot of a certified reference material (CRM) is introduced, it shall be compared, by experiment, against the existing CRM to determine whether there might be a change in the operation of the method.

Human Blood

103.2.24 The requirements in the section above requiring the use of human blood shall not apply where:

a. There are exceptional circumstances making the use of human blood impractical;

b. The method involving the use of non-human blood is fully validated; and

c. UKAS has accepted that the method using non-human blood is acceptable.

103.2.25 The use of non-human blood shall only continue for so long as the exceptional circumstances require it.

Contamination

103.2.0 Analysis for the purpose of s5A [92] can involve detection and quantification of low concentrations of drugs. Further, even low levels of contamination could have an impact on a case.

103.2.1 Forensic units shall monitor for potential contamination events. Examples include, but are not limited to, drugs appearing in blanks, drugs appearing in calibrators or reference material which should not include them and unlikely results such as the presence of cocaine without its metabolite BZE.

103.2.2 Any contamination event shall be treated as non-conforming work and there shall be an appropriate investigation and action.

103.2.3 Forensic units shall address the potential for sporadic contamination [189] events in the reported results (see section 103.3.13 et seq below).

103.3 Reporting of Results

Units

103.3.1 Results shall be reported in units of micrograms per litre to facilitate comparison against the legal limits and avoid any confusion. Results for drugs with a legal limit below 10 µg/L shall be reported to one decimal place. Results for a drug with a legal limit equal to, or greater than, 10 µg/L shall be reported to integer values only.

Calculation

103.3.2 Where analytical results include a value above the ULOQ the mean shall be calculated using (a) the analytical result which is below the ULOQ and the ULOQ for the result which is above the ULOQ. The actual figure may not represent the true mean, but the NLTF figure derived from it is still worthwhile. It is acceptable to note that the mean is less than the true mean as a result of the use of the ULOQ.

103.3.3 Where both analytical results are above the ULOQ the mean shall be reported as above the ULOQ. The ULOQ shall be used for the calculation of the NLTF.

103.3.4 Where analytical results include a value below the LLOQ and above the LOD the value should be reported as too low to report a meaningful concentration. The forensic unit shall determine a form of words to use in such cases.

103.3.5 The result shall be reported by use of a NLTF unless all results are above the ULOQ. The NLTF shall be calculated as follows. [190]

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189 Sporadic contamination is the introduction of an analyte of interest into the blood sample or analytical method (other than from the source of the blood) in an unknown and unpredictable way.

190 Although a specific calculation is provided in the text, mathematically equivalent approaches can be adopted.

103.3.6 The FSREU shall be deducted from the mean of the analytical results. The figure generated shall be rounded down to the number of decimal places noted above. [191]

103.3.7 To illustrate, consider an example of a sample with concentrations of amphetamine in replicate one of 315 µg/L and replicate two of 323 µg/L leading to a mean of 319. µg/L. The FSREU is 20% so the deduction would be 63.8 producing 255.2 µg/L. This would be rounded down to 255 µg/L.

103.3.8 Where both results are above the ULOQ the normal reporting calculation as detailed above shall be carried out, but the figure should be reported as 'greater than ###'. For example, if the ULOQ for BZE is 250 µg/L, and both analytical results exceed this figure, 20% should be deducted from 250, and the result reported as' greater than 200 µg/L'.

103.3.9 The results shall be interpreted on the basis that the figure as rounded is the relevant figure for comparison against the legal limit.

Limits

103.3.10 Where the analytical results are all below the LOD the result may be reported as no drug detected.

103.3.11 Where the drug is detected but the NLTF is equal to or less than the legal limit for the drug the results may be reported as the drug present, but it cannot be reported as being over the limit.

103.3.12 Where the NLTF is above the legal limit the concentration of the drug may be reported as above the legal limit. The report may provide both the mean of the analytical results and the NLTF figure or just the NLTF.

Sporadic Contamination

103.3.13 This section applies where a forensic unit:

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191 Rounding down is not normal scientific practice but in this area, it is seen as appropriate to avoid values being increased.

a. Issues a report including a NLTF for any drug which is above the legal limit for that drug; and

b. Has experienced a sporadic contamination event related to the drug being reported with an NLTF above the relevant legal limit.

103.3.14 In the circumstances set out in paragraph 103.3.13, the highest concentration attributed to sporadic contamination in that forensic unit for the drug of interest shall be provided in the report.

103.3.15 In this section the term report includes a SFR1.

Analysis at the Instruction of Police or Prosecution

103.3.16 To justify a prosecution the results of the method shall allow the scientist to state those results support the proposition that the concentration of the drug was above the legal limit. To assess the extent to which the results of the method support the proposition the uncertainty of measurement shall be accounted for.

103.3.17 Without a standard approach established centrally there could be variability in how measurement uncertainty is accounted for in forensic units leading to the potential for different outcomes from analysis of the same sample by different laboratories. That could lead to the decision to prosecute being determined by which forensic unit performed the analysis.

103.3.18 The use of the FSREU gives rise to the concept of a Common Reporting Threshold (CRT) - the lowest measured concentration at which the result can be reported as being above the legal limit. The CRT for each drug is also given in Annex A. A forensic unit will only report a result as above the legal limit when the reported result of the method is greater than or equal to the CRT for the relevant drug.

103.3.19 The forensic unit shall only provide a figure, which will be the “not less than” figure referred to above, if its expanded uncertainty of measurement is equal to or less than the FSREU.

103.3.20 This document covers the process by which the analytical result is produced and a conclusion reported as to whether the concentration of the drug in the sample was above the relevant legal limit. The use of an agreed uncertainty and

resultant common minimum reporting threshold does raise some additional points.

a. Any report/statement on an analysis shall make clear:

i. That the determination of the “not less than” figure used centrally set expanded uncertainty; and

ii. The forensic unit’s calculated uncertainty for the analysis was no greater (worse) than the FSREU.

b. The requirements in paragraph a above can be achieved by reference to this document being complied with.

Challenges

103.3.21 The use of the FSREU for the determination of the “not less than” figure provides a consistent approach to the CJS. However, any consideration of the reliability of the results (e.g. in response to a challenge) should address the issue of the probability of the analytical results being obtained had the sample been on the legal limit. This should be on the basis of the forensic unit’s true uncertainty of measurement. Otherwise, the CJS will not be provided with an accurate description of the robustness of the evidence.[192]

Analysis at the Instruction of the Defence

103.3.22 The need for consistency in decisions to prosecute, which led to the adoption of the CRT, does not apply to those forensic units instructed by the defence. However, there is a requirement of the CJS for the work undertaken on behalf of the defence to be to appropriate quality standards. Therefore, those instructed by the defence shall comply with this document.

103.3.23 It is clear that forensic units acting at the instruction of the defence using methods with high uncertainty of measurement could have an adverse impact

[192] In a case where the FSREU is 30% but a forensic unit has an expanded uncertainty of 20% and a challenge is made on the basis that the results are close to the limit it is sensible for the court to be advised that the 30% deduction was far more than required and the results are, in fact, not as close to the limit as it might appear.

on the CJS (e.g. by providing inaccurate or misleading results). The forensic units expanded uncertainty at the 99.7% coverage probability (as determined in compliance with 103.2.9) shall be less that the FSREU.

Annex A: Limits Uncertainty and Reporting Thresholds for England and Wales

Legal Limits and Related Data

103.3.24 The legal limits, FSREU and the CRT for each drug are set out below.

Controlled Drug	Legal Limit (µg/L)	FSR expanded uncertainty (%)	CRT (µg/L)	Date limit first established
Amphetamine	250	20	314	14 April 2015
Benzoylecgonine	50	20	64	2 March 2015
Clonazepam	50	20	64	2 March 2015
Cocaine	10	35	17	2 March 2015
Delta-9-Tetrahydrocannabinol	2	30	3	2 March 2015
Diazepam	550	20	689	2 March 2015
Flunitrazepam	300	25	402	2 March 2015
Ketamine	20	20	27	2 March 2015
Lorazepam	100	25	135	2 March 2015
Lysergic Acid Diethylamide	1	45	2	2 March 2015
Methadone	500	25	668	2 March 2015
Methylamphetamine	10	40	19	2 March 2015
Methylenedioxymeth-amphetamine	10	25	15	2 March 2015
6-Monoacetylmorphine	5	35	8	2 March 2015
Morphine	80	25	108	2 March 2015
Oxazepam	300	20	377	2 March 2015
Temazepam	1000	20	1252	2 March 2015

104. Digital Forensics

104.1 Technical Records

104.1.1 The forensic unit shall carry out policies and procedures, appropriate to the device and/or scope of the planned activity, which incorporate:

a. Keeping a record of the state, mode and physical condition of any seized device and any potentially relevant information; and

b. Labelling the components of the device and taking photographs (screen, computer front and back, and the area around the device to be seized) and/or sketching the device's connections and surrounding area where relevant.

104.2 Test Methods

Selection of Methods

104.2.1 A method is a logical sequence of operations or analysis which may include the use of software, hardware, tools, and actions by the practitioner.

104.2.2 The forensic unit shall take account of the need for backup and redundancy when working on cases, to ensure that a single technical failure (e.g. a power loss or disk corruption) will not result in the loss of data on working copies (30 - Control of Data).

104.2.3 Software, hardware, and tools, where operation of these has an impact in obtaining results will require validation within the method they are deployed, or any existing validation to be verified, as laid out in 104.3.7.

104.2.4 The forensic unit shall ensure that, for the range of the digital forensics methods it uses, the validation requirements take account of staff competency levels, the nature and difficulty of the tasks to be carried out, and the level of acceptability of the method in the wider forensic science and criminal justice community.

104.3 Validation of Methods

Risk Assessment of a Method

104.3.1 The risk assessment process detailed in this Code is intended to be used to determine the impact of the overall method used. It is important to look at how a

method or tool is to be used. For instance, when imaging storage media, the risks may include:

a. Altering data stored on the evidential item;

b. Returning incomplete and/or inaccurate data; or

c. Incorrectly determining the media to be unreadable.

104.3.2 In certain parts of the process, the competent use of a suite of software tools or the use of visual/manual checks could be demonstrated to mitigate the identified risks in the method. Proper consideration of the nature of risks at this stage should feed into the development of a method as well as into the validation strategy.

104.3.3 The development of the method for the given forensic science activity and the subsequent validation shall set out how the identified risks are being addressed and how the effectiveness of the method will be tested along with the end-user requirements and specification.

104.3.4 A formal risk assessment method should be used. There are various risk assessment methods that may be chosen, one which may be suitable is called failure modes and effects analysis [33] [71]. Failure modes and effects analysis is a step-by-step approach for analysing each stage of a method looking for potential weakness that might result in a failure of some sort, with consideration of if the failure were to occur, would it be detected without causing harm e.g. an erroneous result being picked up by a quality control.

104.3.5 Whichever risk assessment method is used, inclusion of cross referencing between the stage in the procedure and the risk assessment table, and identifying what controls are to be assessed during validation ensures the testing is focussed. It also provides documentation to support the requirements set out in in 104.3.3.

Validation of Measurement-Based Methods

104.3.6 This Code describes validation for measurement and interpretive methods. For the purposes of digital forensics, the section referring to measurement-based methods is applicable for most methods employed. This includes methods

where direct measurements are not made, such as extraction processes using automated tools or manual methods for the purpose of providing data.

Verification of the Validation of Adopted Methods

104.3.7 In most cases adopted methods or software tools and scripts should follow a tailored process for the validation of measurement-based methods. However, an adopted method would normally be expected to be already well supported through documentation, available validation studies, testing-house studies or published papers. In this case this Code requires confirmation of the applicability of the validation against the required end-user requirement and specification and a documented demonstration that a method works within acceptable performance parameters.

104.3.8 There is a requirement in this Code for the production of an available library of documents relevant to the authorisation of a method and the production of a certificate of validation completion.

104.3.9 The final requirement in this Code is to demonstrate that a method works in the hands of the intended users.

Verification of Minor Changes in Methods

104.3.10 Methods are validated to a specific configuration; therefore any changes in any of the constituent parts (hardware, firmware, script, operating system, etc.) may affect its overall operation and any dependant systems, which could invalidate the results.

104.3.11 Any proposed change shall be risk assessed at the method level as even a patch in a software tool may adversely affect the operation of a second tool or process using its output, e.g. giving a plausible but incorrect date stamp. Other examples include a tool inadvertently becoming write-enabled through a firmware update.

Implementation Plan and Any Constraints

104.3.12 The implementation plan is required to include monitoring of controls and communication that in the digital forensic sciences shall include configuration management, dependencies, how identified software/firmware/hardware bugs are to be handled and how patches, etc. are to be controlled.

104.4 Handling of Test Items

Exhibit Handling, Protection and Storage

104.4.1 The forensic unit shall consider whether the value of any other type of evidence (e.g. fingerprints) that may be present could be compromised during the capture, preservation and investigation of the digital evidence.

104.4.2 The forensic unit shall ensure that devices containing potential digital evidence are packaged, sealed, and transported in such a way as to protect the integrity of the digital evidence.

104.4.3 There are two main issues to consider in the transporting of digital evidence:

104.4.4 The security of the device and digital evidence to ensure that access to it is correctly supervised when moving it from the scene to the laboratory or other location; and

104.4.5 Protection of the device and digital evidence to ensure that it is not affected by physical shock, electromagnetic interference, extremes of heat and humidity or other environmental hazard.

105. Video Analysis

105.1 Scope

105.1.1 This appendix covers all forensic units conducting the FSA. This includes practitioners, technical staff, police staff or police officers conducting the FSA, even if this is not their primary role. It is therefore not limited to activity in a video or imaging unit by specialists.

105.1.2 The previous regulatory framework [4] required accreditation for all specialist activity, however included a limited exemption for the recovery of CCTV footage from a working CCTV system in situ and CCTV replay for viewing with no further analysis by competent staff using methods approved by the organisation

105.1.3 This Code maintains this route for non-specialist front-line staff to continue to recover footage using the manufacturers intended method of recovery from CCTV systems rather than specialist tools. It also allows for limited processing allowing presentation by the individual of the footage as a clip in a factual report. This dispensation of processing is not aimed at video specialists, it is

intended for investigating officers to be able to exhibit material viewed without requiring recourse back to video specialists unless further analysis is required.

105.1.4 FSA 98 Recovery and Processing of footage from CCTV/Video Surveillance systems (VSS) sets out the sub-activities and stipulate the controls that shall be in place to apply the exemption, namely:

a. The organisation's forensic unit has approved processes, methods and tools to be used in this forensic science activity using the following:

i. NPCC Framework for Video Based Evidence [104];

ii. Dstl - Digital Imaging and Multimedia Procedure [126];

iii. Dstl - Recovery and Acquisition of Video Evidence [105]; and

iv. This appendix.

b. The forensic unit (or wider organisation) records and maintain competence of staff it authorises to conduct the above work.

c. Practitioners adhere to the standards of conduct in this Code and the procedures are in this appendix.

105.1.5 Where the data acquisition goes beyond using the manufacturer of the CCTV system in question's intended method, or the processing of the data requires specialist processing, (see section 80, FSA Definition – Specialist Video Multimedia, Recovery, Processing and Analysis, for specific detail) which requires accreditation the Code, which includes adherence to this appendix. This appendix includes activities which exceed activities in section 79 - FSA Definition – Recovery and Processing of Footage from CCTV/VSS.

105.2 Personnel

Competence

105.2.1 All personnel who perform FSAs or sub-activities shall be competent in those activities they perform and records of that competence shall be held. Where the forensic unit holds accreditation, and/or is required to hold accreditation the competence framework shall be suitable for that purpose and comply with this Code in full.

105.2.2 All the FSAs in this Code contain sub-activities which have different requirements in terms of knowledge, training, and experience to be considered competent. The sub-activities under the Section 79 Recovery and Processing of footage from CCTV/Video Surveillance systems (VSS) require those authorising police staff to retrieve data by setting out the expected training and competence for the levels of activity expected. The dispensation requires the organisation to have a procedure to authorise and re-authorise staff and a procedure to approve methods. This procedure for approving methods should be overseen by practitioners from the organisation's own forensic video capability.

105.2.3 The FSA of Recovery and Processing of footage from CCTV/Video Surveillance systems (VSS) is primarily aimed at permitting specified front-line activity, typically by police staff, therefore the Competency Levels detailed in the NPCC Framework for Video Based Evidence [104] are applicable in determining the competence requirements.

105.2.4 Any personnel performing an FSA shall have a clear understanding of the overall video forensic process they are permitted to conduct, and be mindful of the objectives of all operations they perform. Procedures issued for use under FSA Recovery and Processing of footage from CCTV/Video Surveillance systems (VSS) should have been formulated to achieve a desired task without unnecessary transformations, those conducting FSA Specialist Video Multimedia, Recovery, Processing and Analysis shall be competent in the formulation of process workflow to correctly achieve a desired task without unnecessary transformations and be able to assess and explain the impact of video transformations at all stages of the process.

105.2.5 Storage media from digital video recorders (DVRs) will often present unknown, proprietary file-systems. These are not recognised or interpreted by common digital forensic hard disk drive interrogation tools. Thus, to avoid misinterpreting a storage medium as containing no CCTV, a practitioner working to the FSA 80 FSA Definition – Specialist Video Multimedia, Recovery, Processing and Analysis shall be competent at recognising the byte-level indicators of the likely presence of video or audio on such storage media.

105.2.6 Statements related to provision of recognition rather than an identification through comparison should be prepared by individuals competent in the application of the Police and Criminal Evidence Act (PACE) Code D, Code of Practice for The Identification Of Persons By Police Officers [106].

105.2.7 All practitioners shall understand the distinction between expert evidence and evidence of fact.

105.2.8 The person proposing to give opinion evidence shall be an expert in all relevant aspects they intend to give an opinion on. Expertise in CCTV, video, imaging, enhancement etc. does not equate to expertise on the content of the image. Unless they are also an expert in the content of the images, imagery experts should not attempt to give expert opinion evidence on the meaning of a comparison between the objects in question [105].

105.2.9 Image analysis requires specific subject matter expertise of both the system and the subject to be analysed. [193]

105.3 Selection of Methods

General

105.3.1 Forensic units conducting either FSA shall have processes and procedures which are fit for purpose issued under the authority of the SAI. Methods under either FSA where further analysis is expected or accreditation is required shall be validated in line with this Code.

105.3.2 Procedures for FSA Recovery and Processing of footage from CCTV/Video Surveillance systems (VSS) should be developed and/or overseen by practitioners from the organisation's forensic video unit.

[193] An expert in video processing or even facial comparison is not necessarily competent to give an opinion on vehicle identification without demonstrating specific competence in that activity using a demonstrably valid method.

Video Transformations

105.3.3 Where a forensic unit undertakes the transformation of video material, [194] the transformations shall be appropriate for the intended use of the transformed material and shall be documented. Procedures issued for use under FSA 79 Recovery and Processing of footage from CCTV/Video Surveillance Systems (VSS) should have been formulated to achieve a desired task without unnecessary transformations.

105.3.4 Workflows using Digital Evidence Management Systems (DEMS) are prone to automatically processing and transforming video material in ways invisible to the operator. [105] Forensic units should ensure that DEMS are only used in a manner that has been approved as suitable by the SAI.

105.3.5 Often video material received by a forensic unit will already have undergone transformations such as spatial and temporal sampling, digitisation, transcoding and compression. The effect of those transformations shall be taken into account in all subsequent processing and interpretation.

Analogue Video

105.3.6 Where analogue video is to be digitised, the conversion should take place as soon as possible in the process once it has been identified that the footage may be of interest (typically after initial viewing).

105.3.7 As with all transformations, where digitisation is performed it needs to be done so as to minimise any loss of information that may be relevant to the investigation. Equally, any decision not to digitise shall take into account the risks of degradation to the analogue medium and the rationale shall be documented.

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194 Any process that alters the format or information content of video, e.g. digitisation, transcoding (i.e. digital-to-digital conversion of one encoding to another to an alternative file). Video is subject to a series of transformations from its initial creation through to rendering on a display surface for human interpretation. Many of these transformations add and remove information from the video material and should be as non-destructive as is practicable.

105.3.8 Appropriate hardware is required to extract the maximum amount of information in terms of image quality, audio tracks and associated metadata. Any departures from this shall be justified and documented.

Enhancement

105.3.9 Forensic units shall be clear on the purpose of any image enhancement that is to be carried out and anticipate any data losses that may occur as a side effect. Personnel performing enhancement shall be competent to apply and explain the any enhancements selected, and therefore the activity exceeds the basic brightness and contrast adjustment to entire image permitted under the FSA 79 Recovery and Processing of footage from CCTV/VSS.

105.3.10 Images enhanced for one purpose shall not be used for another purpose without fully reconsidering the appropriateness and the risks.

105.3.11 In forensic applications, enhancements should not generally be applied to selective portions of an image unless these regions and the enhancements within them are clearly identified. However, it is permissible to enhance the whole of a cropped image, again with the enhancement/transformations detailed.

105.3.12 It is important that recipients of enhanced images (e.g. investigators, experts or jury members) are not misled in any way. To this end, care shall be taken to ensure that enhanced images are uniquely identified as such and that sufficient information on the performed enhancement is available in the case-notes.

Tracking in Footage

105.3.13 The methodology for tracking (e.g. highlighting or circling) objects or people (either manually or automatically) through recorded footage shall be documented with risks identified and mitigated.

105.3.14 The methodology for redaction (e.g. masking, blurring or pixelating) objects or people (either manually or automatically) through recorded footage shall be documented with the risks identified and mitigated. This is applicable for tracking and redaction whether using specialist standalone tools, or if the SAI has approved, when using a DEMS system for this purpose.

Image Comparison

105.3.15 Forensic units that undertake image comparison shall do the following.

a. Use valid methods. [195]

b. Recognise that image comparison is a form of opinion evidence [127] and is admissible where the judge and jury require the assistance of evidence which depends on the application of specialist skill or knowledge in the field that is under comparison (i.e. are experts) [105].

c. Demonstrate the appropriate competence in relation to the image-based processes [196] [197] that have been undertaken in addition to demonstrating competence in comparison of the type of material being compared in an image.

d. To reduce the risk of confirmation bias[198] , incident footage containing unknown persons or objects of interest shall be analysed to identify distinguishing features before known footage of the suspect objects of interest is viewed or information revealed to the analyst expected to form an opinion as to the activity, identity or perform any comparison. [199] [200]

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195 Validations should include an objective literature review so that the design of the validation study takes into account shortcomings previously identified in the scientific literature in that and all related methods. Methods that been challenged in the scientific literature should not be used unless the validation is shown to overcome previous shortcomings, and the court must be made aware of the previous criticism even if they have been overcome. Previous acceptance in this jurisdiction does not provide evidence of validation.

196 The methodology used should be clear. The method may include the Analyse, Compare, Evaluate, Verify (ACE-V) methodology that is used for other types of comparisons. However, the overall method still requires validation.

197 Experts shall ensure that they act only within their area of expertise; an expert in facial comparison is not necessarily competent to give an opinion on vehicle identification without demonstrating specific competence in that activity using a demonstrably valid method.

198 Such bias is a subconscious act and prior knowledge by the examiner of certain information (e.g. the target number plate, injury, congenital disorders, damage features) may be seen as a source of such bias.

199 The forensic unit commissioned to do the work may be able to insulate the analyst conducting the examination by having a different individual involved in the contract review and case conference. This should ensure that the analyst receives only the information appropriate for each stage of the examination, while still ensuring that proper case assessment can be made and that the most appropriate techniques are used.

200 Experts in sole practice should consider how to advise prospective customers as to whether phased disclosure of the details of the case to them is appropriate, and how this will be managed.

e. Ensure that all relevant information in relation to image processing undertaken by a third party is communicated to the person undertaking the comparison. [201]

f. Demonstrate the decision process and basis for critical findings.

g. Demonstrate that the methods used for comparison are appropriate, through validation, for the image characteristics of the case material. For example, methods developed for high quality recordings may not be valid for low quality CCTV images. [202]

105.4 Validation of Methods

Data Recovery

105.4.1 The procedure for recovery of CCTV footage from digital CCTV system in situ by using the manufacturer of the system CCTV system manufacturers intended method, should be fit-for-purpose. This procedure should be fit-for-purpose for the type of personnel permitted to use it; where non-specialists are the intended users the procedure should contain steps to direct users when the procedure is applicable and also when to cease/not-start a recovery and seek specialist assistance.

105.4.2 When video data are not readily accessible by standard/manufacturers' methods (e.g. due to technical difficulties) it may be necessary to recover these video data in the facility by a process akin to reverse engineering or by using third-party tools. When undertaking this casework the method shall be subject to validation in line with the Code noting especially the following.

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201 Information on image processing is required to understand processing artefacts. Procedures should ensure the analyst receives information appropriate for each stage of the examination, including identifying when information on image processing is required.

202 For example, with comparison of facial images derived from uncooperative/uncontrolled settings (i.e. CCTV), facial feature classification, photo anthropometry/proportional alignment and superimposition/overlaying are all questioned in the scientific literature for both inculpatory and exculpatory purposes. The validation would need to take into account the issues raised, and even if the method is demonstrated to not exhibit the issues raised in the literature, the issue that the generic of method has been challenged in the scientific literature must be disclosed.

a. Not all video material will necessarily be recovered.

b. Data might be incorrectly interpreted (e.g. time and date stamps).

Image Comparison

105.4.3 All methods designed for image comparison require validation, where the comparison uses proportional relationships and/or metrics the validation shall include an appropriate, robust and repeatable method for quantifying the associated uncertainties (see 105.5.4 Photo/Videogrammetry).

105.4.4 Forensic units shall review the scientific literature to identify the following.

a. The scientific basis for the method.

b. Studies critical of the method.

c. Examples of testing methodologies.

d. End-user requirements to be included in the validation, including avoiding any biasing effect of the observer (including juror).

e. Reproducibility of finding (including any verbal confidence scale).

f. False inclusion/exclusion rates.

105.4.5 Image comparison methods which are cited in the scientific literature as unreliable or biased should not be used unless comparable research and validation indicates the issues identified are now controlled. Irrespective of the findings of any such study, the fact that the method was criticised remains disclosable and should be addressed in the statement/report, with the remedial actions that address the issues.

Reliability of Manufacturers' Players

105.4.6 In many instances practitioners will have no option but to utilise proprietary replay software but will not have the practical means of comprehensively validating it. Consideration shall be given to the associated risks and how these may be mitigated in a proportionate manner as required in the Code. For example, the risk mitigation approach may take into account:

a. The context, including what the tool is required to do and how the data will be used;

b. The competence of the practitioner; and

c. How well-established the body of knowledge for the replay tool is within the forensic practitioner community.

105.4.7 The version of software used shall always be included as part of the record. In the absence of this information being available, preservation of one or more screenshot images may provide a basis for identification of the version used.

105.5 Estimation of Uncertainty

105.5.1 The Code require that a forensic unit performing testing is required to evaluate measurement uncertainty, even where the test method precludes rigorous evaluation of measurement such as a test that is qualitative in nature.

105.5.2 The impact uncertainty may have on the finding shall be included in both factual and evaluative reports to the CJS where it is relevant.

105.5.3 Only two example methods are included here, all analytical methods are in scope for this requirement (see also 105.6.13).

Photo/Videogrammetry [203] [204]

105.5.4 When extracting dimensional information from imagery, it is essential that there is an appropriate, robust and repeatable method for quantifying the uncertainties associated with any quoted value.

Derivation of Date/Time/Framing Rate

105.5.5 In cases where timing information from a video recording is crucial (e.g. speed estimations of vehicles from CCTV), a suitable method for quantifying the uncertainty in such a measurement as well as other factors such as measuring

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203 This is taken to be a technique that attempts to compare the proportional relationships of one photo usually using metrics. Related terms include photoanthropometry and to a lesser extent proportional alignment.

204 Empirical research current at the time of this issue indicates photo anthropometry/proportional alignment should not be used in facial comparison involving images from an uncooperative/uncontrolled setting (i.e. CCTV) until methods advance and further research indicates the issues identified are now controlled.

the frame rate shall be employed. This method will take account of the whole recording process (image capture, image encoding, metadata assignment, data storage).

105.5.6 The date/time information provided by the multitude of CCTV systems in use is of highly variable quality. The following shall be taken into account where the date/time information may be important.

a. The displayed time may not represent the actual capture time.

b. It is necessary to consider both the precision and the accuracy of any displayed time as apparent precision may not be an indicator of accuracy.

c. The internal/displayed clock may not be accurate or sufficiently precise.

d. There may be more than one displayed clock.

e. The image capture rate may not be fixed so a calculated average framing rate cannot always be applied to a single specific frame interval.

f. The frame rate setting information contained within the system menu will not always be a true reflection of the actual recorded rate.

g. All computer-based systems are prone to hesitation under load, which can introduce unpredictable interruptions in record sequences.

h. What is displayed might not correspond to what is stored. For example, a CCTV system may display an on-screen clock with second precision whereas the data stored on the unit may actually be stamped with millisecond precision.

i. Time stamps might be a network time stamp of when information is received, not when it is digitised.

105.5.7 Techniques such as extended section analysis, analysis of camera sequence order, interrogation of the system menu and independent timing of the system performance may be considered to provide a holistic view of the accuracy of the derived times/rates. Test recordings cannot confirm the accuracy of the recording at the time of an incident, but can be used to provide an estimate of uncertainties provided the assumption is stated that the recording device was operating in the same manner as at the time of recording.

105.5.8 If the method includes analysis of output from variable rate cameras, the validation and estimate of measurement uncertainty shall include this use.

105.6 Control of Data

Recovery of Data

105.6.1 The overarching requirement of the control of data procedure is to be able to show that the recovered footage is true to the original video recording, and remains so from the point of recovery; in practice a bit-for-bit copy of the original with a method to show it has not been tampered with. [128] Video footage should be extracted in its native format [205] in order to maintain image quality and be stored as a master copy [206] and retained to be available for any future forensic analysis e.g. defence experts.

Inadvertent Overwriting by Digital/Network Video Recorders

105.6.2 Due to the proprietary nature and often limited functionality of some digital video recorder (DVR) (or network video recorders) it is necessary to consider and prevent mechanisms that could result in lost or inaccessible data. Consideration shall be given to the following when processing a DVR device.

a. Disconnecting the hard disk drive (HDD) from the main board of the DVR may cause the HDD to be permanently disassociated from this machine, particularly if new disk or clone is then subsequently connected, rendering the video inaccessible by that machine; this should only be performed by a competent individual as part of a validated method.

b. Connecting a HDD write blocker in line with the HDD may result in the HDD being unrecognisable by the DVR.

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205 Some systems may provide an option to write the sequence to standard playable format such as .VOB or .AVI, which may seem to be an advantage in that the video will be replayable using standard software; however the generation of the playable formats often requires the video to be recompressed, resulting in a loss of quality, and so this method should be avoided at the initial recovery stage.

206 Procedural and supporting guidance is included in Defence Science and Technology Laboratory's publication - Recovery and acquisition of video evidence [105].

c. Clone copy HDDs may be unrecognisable by the DVR, and connection of clones may result in the original HDD being unrecognisable by the DVR.

d. DVR units may go into auto-record mode when switched on – even if no video source is connected.

e. Some DVR units are equipped with timed expiry (refer to Glossary). This can result in data being marked as 'deleted' even if the machine is switched off.

105.6.3 Due to the risks above, data recovery from the DVR once no longer in the original working system is a specialist activity covered by Section 80 - FSA Definition – Specialist Video Multimedia, Recovery, Processing and Analysis.

Creation of a Master and Working Copies

105.6.4 A master exhibit of the source/original data shall be preserved, the forensic unit should define in the procedure what constitutes a master. [207]

105.6.5 Working copies of the video footage may be produced and these will typically be either:

a. A bit for bit copy of the master in its native format, suitable for further analysis by specialists instructed by either the prosecution or the defence;

b. A bit for bit copy of the master in its native format, supplied with a player suitable for investigating officers to view the footage; or

c. A "playable" format suitable for investigating officers to view the footage and potentially for supplying to the CPS marking this as "Converted Format" and therefore no longer a true copy of the original.

105.6.6 Any media produced whereby original data has been converted to a different format should be clearly marked as "Converted Format", or identifiable as such in some other way defined in the procedure.

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[207] Write-once discs, with sufficient protections against tampering and information on continuity, are typically used as master discs. However, if the intention is to use a USB stick or CD/DVD only as a transport medium and to store the master evidence on a secure server then the methodology would require validated steps to demonstrate that the copy remains as recovered (e.g. the validated method may include generation of a hash value at the point of creation on the server).

Conversion from proprietary to generic video format

105.6.7 Video material from CCTV sources often does not conform to the constraints of broadcast video. Transforming video from CCTV sources into video often requires spatial and temporal re-sampling, which leads to a loss of information that may be important in subsequent processing and interpretation. Therefore, any media produced whereby original data has been converted to a different format should be conspicuously marked or uniquely identifiable as such in some other way defined in the procedure (see section 105.6.4 - Creation of a Master and Working Copies).

Wifi Enabled Courts

105.6.8 Court Wifi systems intended for displaying material such as static images and documents may be considered adequate for the majority of cases. However, caution should be exercised when using wireless presentation systems for displaying video material, particularly in cases where there is lots of movement or high-resolution footage. In such cases, there is a risk of lost frames, jitter, or loss of resolution. If replay through wireless systems is identified as inadequate, provision of appropriate playback equipment in court should be sought; if these arrangements are not already in place the forensic unit should discuss this with the instructing authority. [208]

105.6.9 The forensic unit should ensure that any material produced that would not be suitable for display via a wireless presentation system is conspicuously marked as such.

Computers and Automated Equipment

Export of Video and Stills from CCTV Players

105.6.10 Many CCTV players perform a conversion to a broadcast video format either implicitly during playback or explicitly during video export; export should be in

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208 For forensic units instructed by the prosecution, the CPS Complex Casework Unit may need to be engaged and/or CPS caseworkers may outline requirements via EPPE.Enquiries@cps.gov.uk, a minimum of two weeks' notice is advisable.

native format where it is an available option and this native format is what should be used to create the master copy. [209]

105.6.11 Many CCTV players will distort the original recorded material by light, colour, shape and size. They may also not display all frames, or playback recorded audio. They may also detail a timecode and frame rate that is calculated during playback and may not be frame accurate. Any use of a player, either in review, or to achieve a task should be considered and tested. They also commonly re-sample and transcode images when exporting still images. The nature of the transformations introduced by tools used for exporting video and stills from CCTV shall be assessed so that their impact on the subsequent use of the transformed material can be determined.

105.6.12 Replay Software Digital CCTV systems often have an export function so that video footage can be backed up to removal media (e.g. CCTV, Universal Serial Bus hard disk). Proprietary replay software that has been developed and distributed by the system's manufacturer may generally be initially treated as reliable, as forensic units do not have access to the coding in order to verify its implementation. However, if conducting further analysis other than viewing, the examiners shall assure themselves that the software is working correctly on this workstation and investigate further using other replay software if there are any signs of replay issues (e.g. dropping frames, rescaling issues, wrong proportions) that may affect such analysis. [210]

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209 USB sticks are typically considered to be a transport media only, however see section 105.6.5 for exceptions.

210 It should be noted that there may not be obvious signs when replay software is performing incorrectly, so where the footage is to be used for further analysis rather than simply viewing it is good practice is to follow the dual approach, and to document any reason why this has not been possible or relevant in the case. It is also worth noting that the video files exported from the digital systems may contain additional information, e.g. audio, Global Positioning System (GPS), which is not presented by the replay software. If this type of information is of relevance to the case the examiner should investigate further. It is expected that the examiners will have been trained to identify issues with replay software in the competence section 105.2.

Analytics and Tools

105.6.13 The declared performance, in terms of probability detection (PD) and false alarm rates (FAR), of video content analysis tools is dependent on the quality of the video to be analysed. When using video analytic tools for post-event analysis, the forensic unit shall be aware of the impact of video quality on performance. Video analysis tools shall be validated as part of the method they are deployed in, the risk analysis of the actual PD and FAR on the required task shall be undertaken as part of that validation and communicated to the customer.

105.6.14 Video content analytics tools can include any or all of the following:

a. Motion detection

b. Object or person detection

c. Tracking/reidentification

d. Auto redaction

e. Crowd dynamics

f. Behaviour analytics

Authenticity

105.6.15 Video material is often received from uncontrolled sources, therefore this can raise questions regarding its authenticity. Forensic units may be required to carry out authenticity analysis to examine the provenance, or integrity. This authenticity analysis can be carried out either with the use of specialist software tools and a practitioner or as a purely human examination process. However, the use of authenticity tools incorporated into DEMS and their output should only be used as an aid to an investigation for intelligence purposes, statements on authenticity would be expected to be expert opinion.

105.6.16 Authentication can include looking for evidence of:

a. Image content manipulation;

b. Deep fakes;

c. Recordings purporting to be from a different date and time;

d. Association to a particular recording device;

e. Editing to remove pertinent content; and

f. Editing to add pertinent content.

105.6.17 Software may be deployed by an organisation to automatically scan multimedia content at the point of submission or ingestion into an organisations system. These tools shall only be used to give an indication that an asset may require further specialist authenticity analysis.

105.7 Statements, Reports and the Presentation of Evidence

General

105.7.1 Guidance setting out the legal requirements for non-expert technical statements [71] and expert reports [70] has been issued by the Regulator. Compliance or non-compliance [211], with the Code shall be disclosed in statements/reports from all practitioners.

Statements and Reports

105.7.2 Practitioners shall understand the distinction between expert evidence and evidence of fact and be aware of the relevant legal requirements in preparing statements or reports.

Displaying Images

105.7.3 In cases where the detail of an image or the colour of an item is important, (e.g. in court), the optimised set up of viewing screens, prints and other presentation media shall be considered in conjunction with the use of high-quality originals.

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211 Non-compliance is considered to be information that could significantly detract from the credibility of a witness and may have a bearing on reliability. In England and Wales, disclosure of such matters is not restricted to experts as made clear by the Criminal Procedure and Investigations Act 1996 [129], R v Ward [156] and Kumar v General Medical Council [154]). Disclosure of this sort of issue is not to restricted to experts instructed by the prosecution (see Criminal Practice Direction V 19B (1) 13 and Criminal Procedure Rules 19.3 (3)(c)).

105.7.4 Care shall be taken to ensure that recipients of enhanced images (e.g. investigators, experts or jury members) are given sufficient information so as not to be misled.

Interpretation

105.7.5 All imagery viewing requires a degree of interpretation. This may be considered as expert opinion where all reasoning and justification shall be explicitly noted in reports, or where performed under PACE Code D, for factual reporting which also specifies declarations to support the trier of fact is assessing.

Multiple Evidential Approaches

105.7.6 Where the expert has undertaken several forms of analysis (e.g. height analysis and the comparison of physical features) the report shall make clear the opinions and conclusions reached by the expert in relation to each of these individually. The expert may then provide an overall opinion and conclusion.

106. Geolocation - Cell Site Analysis

106.1 Scope

106.1.1 Cell site analysis relies on:

a. The acquisition of communications data;

b. The processing of those data, often in association with data captured during a radio frequency (RF) propagation survey;

c. The presentation of those data in the form of maps and tables with an expert report.

106.1.2 This appendix covers the forensic unit's work as applicable to the scope of performing the forensic science activity.

a. Request and/or normalise call data records in order to present call data in the form of maps/tables and produce an investigative report or streamlined forensic report 1 (SFR1)[212] as an expert summary.

b. RF propagation survey to capture the cell sites that serve[213]/cover a defined area, and WiFi if applicable;

c. Cell site analysis processing of that data and the presentation of an expert report.

106.2 Independence, Impartiality and Integrity

106.2.1 The forensic unit shall ensure that all of its practitioners adhere to this Code in respect of their independence, impartiality and integrity, and that the organisational structure of the forensic unit, policies and procedures support this rather than hinder it.

106.2.2 This Code includes various impartiality requirements, including within the standards of Conduct, for policies and procedures not only to prevent internal and external influence on the results of their examinations and tests, but also cover the corrective action (such as formal disclosure) to be taken if there is a possibility of a practitioner's judgement having been, or perceived to have been, compromised.

106.2.3 All analyses shall be conducted in an unbiased manner. For example, consideration of both the prosecution and defence hypothesis, if available, or attempting to determine the defence hypothesis.

106.2.4 All forensic units are required to demonstrate that they meet these requirements, which shall include the following.

a. The documentation is compliant with this Code and staff adhere to the documentation.

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212 The SFR1 is not a witness statement or an expert's report.

213 This refers to all cells that serve a location or area.

b. The consideration of one or more alternative hypothesis. In the absence of a stated or obvious defence position (e.g. home address), a null hypothesis (e.g. whether there is data in conflict with the prosecution proposition) may be adopted.

c. The terminology used in reports shall be clearly defined and imply no bias.

i. Phrases in reports such as ‘in the vicinity of’ may only be used if qualified; [214]

ii. Phrases such a ‘consistent with’ should not be used in reports unless all other scenarios the findings would be consistent with are given. [215]

d. Cell site analysis may be used to propose investigative avenues (i.e. to help form a hypothesis). If a hypothesis has been produced through a different process, cell site evidence should only be used to test whether that hypothesis is expected by the evidence; it should never be used to test whether the hypothesis supports the allegations or scenarios being put forward in the case independently of the evidence. Care should be taken not to transpose the conditional aspects of any assertion.

e. The use of an independent review of casework including, where appropriate, that this is done independently without prior knowledge of the original outcome.

f. The documentation and review of individual specific case assessments and strategies.

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214 Vicinity an ill-defined word that, if used, must be quantitatively defined (i.e. given a specific indicative value) and not used in a way that might imply a level of precision that is not supportable by the findings. To say that “the device is in the vicinity of the location” where vicinity actually means the service area of the cell (which could be many kilometres from the mast so includes many other vicinities, locales or environs), could be misleading if this is not made immediately clear that this is a large area. Using the word with different quantitative definitions in the same statement or report should be guarded against.

215 In the appeal court, in R v. Puaca [2005] EWCA Crim. 3001 [155] Lord Justice Hooper commented that: “Whereas ‘inconsistency’ is often probative, the fact of consistency is quite often of no probative value at all.” Even the term inconsistent is problematic if evaluating an alibi location when measurement uncertainty in the form of false negatives in the coverage area is likely.

106.3 Review of Requests, Tenders and/or Contracts

106.3.1 As part of contract review the forensic unit shall ensure that the commissioning party is made aware of any limitations, false negative rates or caveats that are already known to apply to this type of analysis or service offered by the forensic unit.

106.3.2 For example, analysis of call data records may demonstrate that the phone was within the area covered/served by a specific cell at the time of the beginning and/or end of the call. The customer must be made aware that although locations of interest may be surveyed, pinpointing the phone to a specific location is almost always impossible.[216] Additionally, a location of interest and an alternative location may be so geographically close that the radio survey data obtained at them is the same or substantially similar. In that case the customer shall be informed that there is no reasonable way of inferring at which location the call event was more likely to have occurred.

106.4 Setting Examination Strategy for Geolocation - Cell Site Analysis

106.4.1 This strategy should focus on ensuring request is appropriate, material supports request and there are clear propositions to be addressed and an outline plan/strategy of how the analyst plans to evaluate the proposition. It could include an independent review of the proposed survey strategy or justification for not surveying.

106.4.2 There shall be a procedure defining the setting of forensic strategy. The procedure shall include the following.

a. Dealing with task-relevant[217] case circumstances.

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216 There may be rare exceptions with an indoor cell or femtocell, see 106.11.5.

217 Procedures should be designed to control the flow of information relevant to the stage of the process to counter cognitive bias; task irrelevant information maybe circumstances of an arrest, including admissions of guilt, task-relevant information would include anything to assists the development of a defence proposition.

b. The data available (call data records, cell information, etc.).

c. The limitations of the data. For example, where conclusions are solely or largely based on interpretation of General Packet Radio Service (GPRS) billing data, or in situations in which the prosecution and defence scenarios are so similar that cell site techniques will be of little use in attempting to discriminate between them.

d. The suspect's personal situation (for example, place of work, home address).

e. Known or suspected attribution of phones.

f. Survey requirements:

i. Location survey (including potential requirements for elevation, for example, high floors in tower blocks);

ii. Area survey, to distinguish whether the service between two or more locations can be differentiated; and

iii. Cell mapping, to measure the service area of a given cell where relevant to the case.

g. If the circumstances of the case change or results/information indicate the strategy needs to be amended, the strategy will need updating and independently reviewed/checked.

106.4.3 Plotting of locations of interest (scene, mast locations and other specified addresses) may be conducted to provide an overview of the mobile telecommunications aspects of the case. These maps may be used to inform a more detailed surveying strategy or serve as the output in their own right (i.e. a theory-based 'desk exercise') including identifying the following.

a. Potential survey locations.

b. The relevant network(s) to survey.

c. Any variations from the scope as detailed in the quote/briefing sheet that may be required following an evaluation of the case scenario and case data.

106.4.4 Although the plotting of mast locations and estimated direction of service (for example, sectors) may be used in the planning process, any estimations or unverified information shall be marked up as such.

106.4.5 There are many ways in which analyses may be undertaken; case circumstances vary and so the methods used may also vary. The strategy shall therefore detail the rationale for the approach taken with reference to the survey type (for example, location, area surveyed, cell mapping) and mode selected (for example, idle, connected, Software Defined Radio).

106.5 Checking and Primary Review

General

106.5.1 The forensic unit shall have a procedure for checking (including for critical findings).

106.5.2 This section describes the following types of check and their expected application.

a. Examination Strategy Check.

b. Technical Check.

c. Critical Finding Check, including the manner of tiggering the check with the correct level of independence.

i. With full sight of the original practitioner's findings (i.e. open); or

ii. With no sight of the original practitioner's findings; or

iii. With no sight of the certain aspects of original practitioner's experience-based findings (see 106.7.4).

106.5.3 The procedure shall ensure that check stages are clear, and it is clear when the independent check is to be performed blind. The expectation that decisions to blind any finding are made in the preceding stage(s), the practitioner may have a rule-based escalation route within their procedures to flag and/or separate out checks to be performed blind (see section 106.7.3 for criteria for triggering blind review). The identification of blind checks is enabled by either:

a. The expert generating the original report identifying those aspects of opinion that will require blind check.

b. The Technical Checker identifying those aspects that were critical findings but that they could not check via referenceable data or deductive inference.

106.5.4 The procedure does not have to specify the checks listed in 106.5.2, to be conducted in that order. Forensic unit's may find that if the expert generating the original report identifying can identify aspects of opinion that will require blind check (i.e. 106.5.3a), and can present these separately for checking as in 106.5.2c.iii then this check may be performed first. Checking the aspects identified here before the technical check, may allow for the same checker to then perform the other checks. The procedure may include other alternative workflows, the intention is however for the person performing the blind check to not be sighted on original practitioner's experience-based findings.

106.6 Examination Strategy Check

106.6.1 The procedure for carrying out checks shall establish if work carried out conformed to the following.

a. Has the question presented been addressed?

b. Is the process adopted to answer the question legitimate and have the limitations been declared?

c. Is the method used applicable to the purpose? For example, a limited survey may demonstrate service of a cell at a given location at the time of that survey; If the cell does serve an area including the scene, an indication as to whether that cell is a particularly large cell (and therefore a less discriminating finding than otherwise might be the case) may be appropriate in the absence of a testable alternative proposition; this opinion may or may not be informed by survey data.

d. If a conclusion has been reached, is the question presented within the expertise of the examiner? Is the evidence expected given the conclusion drawn (i.e. is the supporting summary of findings correct and relevant)? For example, it is normally not possible to address legitimately whether it is likely that a person used a phone (rather than whether the data for a phone would be expected, given that a specific person used it).

106.7 Technical Check

106.7.1 A technical check of the evidential product is made with reference to the report, supporting exhibits, and data on which the analysis has relied. It is therefore an “open” check, with awareness of the conclusions reached and with full access to the material relied on. The technical check is to ensure that:

a. Factual information (e.g. times, dates, locations, cell IDs) are correctly presented both in the report and supporting exhibits.

b. Opinions on technical matters, such as whether a given cell serves an area including a specific location are overt, based on verifiable information (e.g. survey data) and are supportable.

c. Local procedures have been followed and appropriate methods used.

d. Data relied upon has been converted/presented/ referenced correctly.

e. Survey data (if used) is appropriate and presented correctly,

f. Caveats concerning the findings are presented.

g. There is sufficient data to draw the conclusion offered.

h. The method used to draw the conclusion offered is appropriate.

i. The work is fully documented in the case notes.

j. There are appropriate checks on critical findings, calculations and data transfers.

k. Work is produced in compliance with the forensic unit's documented policies and procedures.

l. Conclusions are consistent with the broader contents of the report or statement.

106.7.2 The forensic unit shall ensure that methods that require calculations (including those embedded in spreadsheets) and/or critical data transfers that do not form part of a validated process include checks carried out by a second person. A policy/procedure shall define the nature of the transfers and the checking procedure that shall consider the accuracy and/or applicability of the following:

a. Call data records.

i. The call data records are the foundation of cell site analysis. Call data are supplied in varying formats (according to network) and in a format that normally requires reformatting and/or normalisation, which should be validated (see 106.10.3).

ii. Specific call data that have been determined to be unreliable have been correctly excluded (for example, other party cell site information).

iii. Format of data (for example, call event nomenclature, time, date etc.).

iv. Normalisation of data (for example, conversion of latitude and longitude to British national grid, postcode to a co-ordinate system).

b. Mapping.

i. Presented data (for example, cell site locations,[218] locations of interest) are correctly positioned and labelled. [219]

ii. If a period of call data is illustrated, the map illustrates all of that data. If an incomplete selection of data are presented, these are declared as such.

c. Survey.

i. Do the data correspond to the location of interest?

ii. If serving cell data[220] are presented, are these data an accurate reflection of the survey data (for example, correct network and protocol, correct cell ID)?

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218 An indication should be given to how the cell mast locations were derived. For example, verification through actually visiting the location or as presented by the service provider.

219 Any analysis or presentation of cell site data using mapping (either digital or paper) must demonstrably ensure that this is carried out using a common mapping projection so as to correct any potential distortions in location, area, distance, etc.

220 These are data referring to all cells that serve a location or area.

iii. Are there sufficient data to adequately answer the question presented?

106.7.3 Reasoning for, clarity of and supporting objective (referenceable) data (e.g. survey data indicates that the cell serves an area including the location of interest) for opinion on specific technical matters arising must also be checked, which include when:

a. Cell usage at specific dates and times contradict other events in a similar period, and cannot be easily explained.

b. A cell was expected to provide service at a location of interest, was on air during the survey, but was not detected there and opinion has been given on whether it would be expected to have served or not.

c. Service of a given cell was detected, but not as expected, (e.g. the survey results suggest irregularities with the reported azimuths from the CDR as might occur with “crossed-feeders”).

d. Cells which are detected serving at more than one of the key locations are highlighted (i.e. that other possible explanations of the data relevant to the propositions are raised, rather than “cherry picking” data expected given only one of the propositions).

106.7.4 Where all findings reviewed in 106.7.1 are fully supported by objective (referenceable) data then the critical finding check may proceed as an open check, however, if the finding(s) is based the experience of the practitioner rather than direct objective (referenceable) data this shall be considered for a blind check.

106.7.5 The procedure shall detail how casework is identified for checking blind, how individual aspects will be presented for checking, and/or how the full report is to be verified blind. [221]

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221 If the forensic unit has correctly implemented phased disclosure with discrete aspects pared off for checking, it may be possible for the same individual to perform both the technical and a blinded critical findings check.

106.7.6 Examples of situations which may trigger a blind check include:

a. Where a cell is used during the incident, the cell has not been measured, and comment is made on its potential service area including the locations specified in the prosecution and/ or defence propositions.

b. Where a cell is used during the incident, the cell has not been measured, and comment is made on its potential service area excluding the locations specified in the prosecution and/ or defence propositions.

106.8 Critical Finding Check

106.8.1 A Critical Finding is information (a fact or opinion) which directly and substantively affects the overall conclusions (i.e. whether the data as a whole might be expected given the declared propositions).

a. For example, if a cell was listed during the period of the offence, opinion on whether the time can be relied upon (e.g. for GPRS events) and whether the cell served an area including the scene and/ or alibi locations would be a critical finding (potentially amongst many other, similar, findings).

b. Conversely, other parts of the analysis (e.g. a commentary of general cell usage in periods where nothing specific is alleged by either prosecution or defence) would not be critical findings.

106.8.2 Where a critical findings check is the only substantive quality control procedure for checking that finding, then this check shall be performed without knowledge of the original result (i.e. blind) and this independence shall be identifiable from the records. Findings which have a blind check involves a second expert providing an independent technical opinion in isolation of the original opinion to be checked, this may be those aspects of opinion identified by the expert generating the original report, during the technical check or by another rules-based aspect of the procedure.

106.8.3 The critical finding check involves the review of the technical findings (with some elements being “blind” as required and as outlined above) against the proposition and an independent conclusion drawn which on completion is compared to the original conclusion by the first analysis.

106.8.4 This stage can also include the technical check of other data if applicable as long as the independent blind checks are completed first is undertaken by the same person.

106.8.5 This check will also review the complete report in context after the check on the conclusion is completed (with some elements being “blind” as required and as outlined above). Any disagreement is logged, and a conclusion acceptable to both parties reached, with reasons declared.

106.8.6 The Forensic Unit shall have a process in place to resolve differing opinions for the circumstance in which no such agreement can be reached, including how the issue is raised in the expert’s report. as part of the critical findings check on conclusion of analysis it can also include the final check on the follow.

106.9 Competence

106.9.1 Each role in the examination shall be defined in the procedure, including the requirements for knowledge, training, experience and any specific qualifications for the tasks assigned to each role.

106.9.2 For practitioners involved in handling call data records and producing maps or tables from them, the training records shall define the role. The competences to be addressed shall include the following.

a. Acquisition of communications data.

b. Normalising data.

c. Quality assurance stages.

d. Accepted practices for differentiating between estimated coverage plotted for planning purposes and factual plotted data.

e. Presenting call data in the form of maps/tables and/or to produce an investigative or streamlined forensic report 1 (SFR 1).

106.9.3 Practitioners conducting a radio frequency (RF) propagation survey shall be assessed to demonstrate the following.

a. Ability to contribute to the development of a survey strategy or implement given or standardised strategies.

b. The competence of the individual to:

i. Select the survey method:

a. Idle mode;

b. Connected mode (for example, dedicated);

c. Software Defined Radio (if validated for use in the forensic unit);

d. Location survey;

e. Route and/method of survey;

f. Area survey; and

g. Cell mapping.

ii. Apply the survey method;

iii. Correctly interpret the output of the survey.

c. Use of survey equipment in idle and connected modes.

d. Understanding of limitations of survey types and use of data.[222]

e. Where part of the role, knowledge of WiFi or other RF communications standards.

f. Understanding the responsibilities of expert witnesses and the role of assistants and analysts.

g. Preparation of reports.

106.9.4 The forensic unit shall demonstrate ongoing competency of all analytical staff. This may involve:

a. Reviewing technical records;

b. Completing a competence test involving a known outcome exercise or a repeatability study; and

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222 This shall be specific to the survey equipment in use as well as the generic types derived from the information collated or produced in the validation study.

c. A witnessing procedure to ensure that those conducting RF propagation surveys retain competence (ILAC-G19 3.8).

106.9.5 Training programmes shall include legal awareness training to include how the forensic unit's procedures comply with the following:

a. Criminal Procedure Rules, specifically Parts 1, 3, 16 and 19; [35]

b. Criminal Practice Directions V Part 19; [27]

106.9.6 Training programmes shall also include legal awareness training to include an overview of the following:

a. Regulation of Investigatory Powers Act 2000 (if relevant to role); and

b. Criminal Procedure and Investigations Act 1996 [129].

106.9.7 Evaluative evidence in cell site analysis includes assessments of whether or not for a given call data record, for example the records would be expected if:

a. The data might be expected given that the user of the phone was at the scene during the offence (as alleged by the prosecution) or at their home address (as claimed by the defence)

b. The call data might be expected if the suspect was the user of the device, or whether there is any data in conflict with that proposition.

106.9.8 As well as the skill and competence required to technical activities (e.g. surveys, mapping, CDR normalisation) training programmes for staff involved in this activity shall include the following.

a. Development of a forensic strategy.

b. Assessment and interpretation skills:

i. formulating and testing hypotheses;

ii. awareness of the risk of transposing conditionals;[223] and

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223 The 'fallacy of the transposed conditional' is a fallacy of reasoning, also known as the 'prosecutor's fallacy' or 'confusion of the inverse'. It is where the conditional part of the assertion and its probable result are moved around so it no longer remains true.

iii. appropriate terminology (see 106.2.4c).

c. Suitable theory training on what inference might be drawn from consideration:

i. Survey data (limitations from validation studies);

ii. Network appropriate knowledge of RF technology (i.e. network design and operation);

iii. Different types of CDR artefacts (e.g. GPRS or end cells).

d. Awareness of cognitive bias. [23]

e. Preparation of expert reports and statements.

106.9.9 Where members of staff are expected to give evidence in court, training programmes shall also include training in the presentation of expert evidence. [224] [27] [21]

106.9.10 The location of the device is not in the CDRs, but the area in which it was operating may be inferred from the detail within the records. Inference is synonymous with opinion, and all opinion evidence is expert evidence. If the purpose of the analysis is to assess where the phone was, this is expert activity.

106.9.11 Expressing opinions is the role of the expert witness; this includes providing evaluative evidence. Personnel interpreting results shall have been assessed and deemed competent before reporting statements, including in the interpretation and opinions of results and findings.

106.10 Validation

Selection of Methods

106.10.1 All methods of examination/testing shall be fit for purpose; in demonstrating this, the forensic unit will need to have appropriate supporting validation/verification material compliant with the requirements of this Code. [33]

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[224] In addition to an understanding of the Criminal Practice Directions V Part 19, training material may include reference to the information document FSR-I-400 on legal obligations. [21]

106.10.2 The overall method selected shall be validated, tools are tested within the validation. Cell site analysis can comprise sub-methods, selected as required; each of these (for example, survey) can be validated as separate entities. The most appropriate method should be selected based on the strengths and limitations of those available to answer the needs of the customer.

Validation of Methods

106.10.3 It is a requirement that validation of methods shall have been undertaken prior to use in evidence. The whole process (i.e. from request/receipt of call data through to provision of final opinion) shall be validated for the method to be acceptable. If any aspect has not been validated, this shall be explicitly highlighted as a limitation in the accompanying report so that a court may take a view on admissibility.

106.10.4 Validation is about providing objective evidence that the method is fit-for-purpose; this is described in the end-user technical requirements and acceptance criteria. Objective evidence to demonstrate aspects of the end-user's requirements may be drawn in part from:

a. A literature review;

b. The practitioner community;

c. Academic studies;

d. Collaborative trials;

e. Data collated by the forensic unit or training establishments (which require verifying by the forensic unit) using defined scenarios.

106.10.5 The validation procedure shall include where relevant, but is not limited to, the following.

a. Determining the end-user's requirements and specification.

b. Risk assessment of the method.

c. A review of the end-user's requirements and specification.

d. The acceptance criteria.

e. The validation plan.

f. The outcomes of the validation exercise.

g. Assessment of acceptance criteria compliance.

h. Validation report.

i. Statement of validation completion.

j. Implementation plan.

106.10.6 This Code describe in detail the requirements of all the above. However, some introductory words on the end-user requirement and further information on risk assessment requirements is given in the following sub-sections.

Determining the End-User's Requirements and Specification

106.10.7 The end-user requirements include interim-user requirements but should be framed by the end-user being the wider CJS.

106.10.8 This is about the method not the requirements of the specific equipment used. It is not a reiteration of the user manual of survey equipment or phone emulator. The requirements and specification are used to gauge the scale of validation study based upon the acceptance criteria defined.

Risk Assessment of a Method

106.10.9 A risk assessment is required and is used to determine the hazards of a method. The validation shall test the mitigation strategy to control the identified risks. The test employed may vary according to the method.

106.10.10 Within the CJS, some risks may be defined as:

a. False positives (for example, stating that a phone was, or may have been, in an area where it could not); or

b. False negatives (for example, stating that a phone could not have been in an area where it could).

106.10.11 The risk assessment is used to develop the validation plan; risks identified should be tested against the overall method. The method is more than the test of survey equipment; for instance the method may require additional activity to give assurance that the risk of identified types of false negatives are managed in a way that the testing of instrumentation alone would not give (for example, in Section 106.11.6).

106.10.12 The risk analysis shall assess all of the technical stages that may contribute to these risks being realised. Examples include the following.

a. Call data record normalisation:

   i. Transcription errors;

   ii. Inclusion of incorrect information (for example, ‘other party’ cell site) without recognising it as such;

   iii. Exclusion of legitimate information (for example, transcription errors); and

   iv. Use of GPRS without recognising limitations.

b. Mapping:

   i. Misrepresentation of a cell site in the wrong location, for example, labelled with an incorrect time of usage and/or cell identification; and

   ii. Inappropriate sector representation.

c. Survey:

   i. Failing to detect a legitimately serving cell relevant to the case (methods that rely solely on a static survey are prone to this); and

   ii. Failing to recognise that there may have been a network change (for example, not checking that a cell of interest is off air at the time of the survey).

d. Interpretation:

   i. Cognitive bias;

   ii. Incorrectly identifying reasonable propositions;

   iii. Not assessing and expressing uncertainty in findings in a meaningful way;

   iv. Inadequate quality management of any of the risks above.

Statement of Validation Completion

106.10.13 This Code require that a statement of validation completion is prepared. The forensic unit may conduct a RF propagation survey as a separate service (such

as for virtual ‘scene preservation’ in response to an incident to capture serving cell activity) to cell site analysis. In this instance although aspects of the validation study may be shared, separate statements of validation completion may be appropriate.

106.11 Uncertainty in Measurement

106.11.1 There are inherent uncertainties within cell site analysis no matter which methods have been applied. This Code and ISO17025 [1] require the forensic unit to identify the contributions to measurement uncertainty, noting that ISO17025 [1] accepts that where “the test method precludes rigorous evaluation of measurement uncertainty, an estimation shall be made based on an understanding of the theoretical principles or practical experience of the performance of the method.”

106.11.2 Networks can change over time and there may be differences in network operation between the time that the activity took place and the time the activity is analysed in the context of an investigation. Some aspects may be physical changes (for example, changes to the built environment, cells being added, removed or reoriented, decommissioning of assets in 3G network, Stacked cells) or organisational (for example, routing or location area boundaries that may affect cell boundaries). There may also be temporary equipment faults.

106.11.3 Full cell site surveys assist in estimating the area where a mobile device was. However, further uncertainty within surveys can result from the following.

a. Any changes to the network in the area considered during the time that has elapsed since the event of interest and that of the survey.

b. Survey equipment may not directly reflect the operation of the questioned device.

c. Interpretation of the data (false positives/negatives).

d. The height at which the survey was undertaken compared with the actual location and the height that the original connection was made to the cell site in question.

106.11.4 Given these uncertainties, cell site analysis will not be able to pinpoint the location of the subject device. The terminology used in reports shall reflect this

when referring to specific locations that were assessed. For example, phrases such as “the cell used by the subject phone was detected providing service over a cell service area that includes [the location of interest]" may be appropriate.

106.11.5 For example, a practitioner with the appropriate competence may be able to comment on the general anticipated coverage area of cells of interest, and thereby provide some context to their findings. For example, assessing the expected coverage area of a cell from the network information, if it is:

a. An indoor cell (in which case usage implies that the user was within the building – a very precise assessment); [225]

b. A 3m street works dwarfed by the surrounding buildings (in which case the service area may only be that and possibly a few adjoining streets, again, a relatively precise assessment);

c. A large rural macro cell based on the top of a 60m tower (which may provide a service over a large area, perhaps 10 or 20km from the mast and thus provides much lower precision and is potentially of lesser evidential impact).

106.11.6 There shall be a policy or procedure that includes additional activities that are undertaken if it has been concluded that a cell does not serve at a specific location when it is expected to and that is relevant to the case. This shall include one or more of the following.

a. Assessing antenna point direction (azimuth).

b. Examine the path profile between mast and location to check for obvious terrain obstructions, etc.

c. Reviewing survey data to identify if the cell seen in other locations (contributes to verifying that it is on air without visiting the cell).

d. Reviewing neighbour data to see if the frequency that the cell is on is visible or used by a different cell.

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225 Although additional work may be necessary to prove that a 'femtocell' (see Glossary and Terminology) indoor cell was actually located at the stated address at the time (as such devices can be moved and connected to the network from other locations.

e. Checking the mast location by visiting or even via Google Maps Street View to see if the cell is:

i. Physically present; and

ii. Links appear intact and/or if visiting is on air.

Part G - General Information

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108. Acronyms and Abbreviations

Abbreviation	Meaning
2FA	Two Factor Authentication
3G	Third Generation
ACE	Analysis, Comparison and Evaluation
ACE-VR	Analyse, Compare, Evaluate, Verify and Report
AFIS	Automated Fingerprint Identification System
BPA	Bloodstain Pattern Analysis
BS	British Standard
BZE	Benzoylecgonine
CCTV	Closed-Circuit Television
CDR	Call Data Record
CJS	Criminal Justice System
CPS	Crown Prosecution Service
CRM	Certified Reference Material
CRT	Common Reporting Threshold
DEMS	Digital Evidence Management Systems
DNA	Deoxyribonucleic Acid
Dstl	Defence Science and Technology Laboratory
DVR	Digital Video Recorder
EDIT	Evidential Drug Identification Testing
EM	Electro-Magnetic
EMS	Environmental Monitoring Sampling
EN	European Norm
ENF	Electrical Network Frequency
EU	European Union
EWCA	England and Wales Court of Appeal
EWHC	High Court of England and Wales
FAR	False Alarm Rates
FSA	Forensic Science Activity
FSR	Forensic Science Regulator
FSRA	Forensic Science Regulator Act 2021
FSREU	Forensic Science Regulator Expanded Uncertainty
GPRS	General Packet Radio Service
GPS	Global Positioning System
GSR	Gunshot Residue
HDD	Hard Disk Drive
HM	Her Majesty’s
HOC	Home Office Circular
HTML	Hyper Text Markup Language
ICE	Infrequently Commissioned Expert
IEC	International Electrotechnical Commission
ILAC	International Laboratory Accreditation Cooperation

Abbreviation	Meaning
ILC	Inter-Laboratory Comparison
IPSec	Internet Protocol Security
ISO	International Organization for Standardisation
IT	Information Technology
LLOQ	Lower Limit of Quantification
LOD	Limit of Detection
MP	Member of Parliament
MRM	Multiple Reaction Monitoring
NLTF	Not Less Than Figure
NPCC	National Police Chiefs' Council
PACE	Police and Criminal Evidence Act (1984)
PAS	Publicly Available Specification
PCR	Polymerase Chain Reaction
PD	Probability Detection
PDF	Portable Document Format
PPE	Personal Protective Equipment
PT	Proficiency Test
QC	Quality Control
QMS	Quality Management System
R	Regina
RF	Radio Frequency
SARC	Sexual Assault Referral Centre
SD	Standard Deviation
SDM	Standard Deviation of the Mean
SFR	Streamlined Forensic Report
SI	International System of Units
SLA	Service Level Agreement
STR	Short Tandem Repeat
TLS	Transport Layer Security
UK	United Kingdom of Great Britain and Northern Ireland
UKAS	United Kingdom Accreditation Service
UKIAFT	United Kingdom International Association of Forensic Toxicologists
ULOQ	Upper Limit of Quantification
VSS	Video Surveillance System
WADA	World Anti-Doping Agency
WPA2	Wi-Fi Protected Access 2
WPA3	Wi-Fi Protected Access 3

109. Glossary

2021 Act	The Forensic Science Regulator Act 2021. [10]
Accredit(ation)	Procedure by which an authoritative body gives formal recognition that a body or person is competent to carry out specific tasks.
Accuracy	Ability to get the true result (see True Value). For quantitative tests the accuracy expresses the closeness of agreement between the true value and the value obtained by applying the test procedure a number of times. [130]
Administrative Check	A review to establish that the records/reports comply with the forensic unit's policies with regard to content and structure of such records.
Allele	A genetic variant at a particular location within an individual's DNA.
Analogue Video	Video that is in non-digital form and the maximum detail is determined by the frequency response of the analogue system. It is generally stored on magnetic tape and as such shall be regarded as being fragile since repeated use may result in damage and or degradation.
Analysis	The convention has been adopted that the term 'examination' refers to the investigation of an item, person or location with the intention of locating, identifying and recovering material or information of interest. The term 'analysis' refers to any form of test, comparison or analytical method performed on an item or relevant material recovered from an item. The information produced by examination and analysis shall be collectively referred to as 'observations'.
Analyte	Substance to be identified or measured; in digital forensic science it may be taken to include data as the focus of the analysis.
Appendix	See Appendices to the Code
Appendices to the Code	The content of Part F – Appendices of this Code.
Artefact	Something observed in an examination or analysis that was not originally present but occurs as a result of the procedures employed for examination or analysis.
Assessment	The application of expert judgement to devise an examination strategy (see Examination Strategy), based upon a framework of circumstances in the form of written submission details, photographs, 'preview' examinations of items, discussions with submitting officers etc, that addresses in an effective way the identified key issues in the case.
Attribution	Attribution is the process of attempting to assign a device to an individual and may be progressed through a number of different methods, each method having different risks. Cell site analysis may be one method by which patterns of usage may be assessed against

	what would be expected if a given device was used by a specific person, as opposed to if it was not used by that person.
Audit	A systematic, independent and documented process for obtaining evidence and evaluating it objectively to determine the extent to which specified criteria are fulfilled. [226] Internal audit: sometimes called a first-party audit, conducted by, or on behalf of, the organisation itself for internal purposes. External audit: includes what are generally termed a 'second-' or 'third-party' audit. Second-party audits are conducted by parties having an interest in the organisation, such as commissioning parties, or by other persons on their behalf. Third-party audits are conducted by external independent organisations. Such organisations provide certification or registration of conformity with requirements such as those of ISO 9001. [131]
Best Serving Cell	'Best serving cell' is an engineering term referring to the cell selected by a device at a given time for service, disregarding other cells that may also serve. The use of this phrase is misleading in the forensic arena, as it implies only a single cell would normally be available to provide service at any given location. Caution should be given if this phrase is encountered; it should not be used in reports unless a full description of the limitations of usage is provided.
Blank	A sample containing none [227] of the analyte of interest, used in analysis for detecting the background level of the analyte in the matrix or contamination (see negative control).
Broadcast Video	Video material from one of the four broadcast and video standards and recording formats commonly in use around the world: NTSC, PAL, SECAM and HDTV. Tools for broadcast video typically assume a fixed frame rate and a limited set of image sizes and pixel aspect ratios
Biological Material	See Human Biological Material
Body Fluids	See Human Body Fluids
Calibration	The set of operations that establish, under specified conditions, the relationship between values indicated by a measuring instrument or measuring system, or values represented by a material measure, and the corresponding known values of a measurand.
Case Assessment	See Assessment.
Casework Sample	Material of unknown origin believed to have originated from a person of interest (suspect or victim), a location, a specific item/source or illegal substance, sometimes referred to as the questioned sample.

[226] In forensic science an audit normally involves determining whether the forensic unit's quality procedures have been complied with.

[227] In practice this must be interpreted as having a concentration below the limit of detection of the method employed.

Categorical Opinion	An assertion that, in the view of the expert, a particular proposition is definitely true (or definitely false).
Cell ID	A number used in cell site analysis that uniquely identifies the cell for a given Network Operator.
Certificate	A specific format for evidence allowed by certain statutes. [228]
Code	The code of practice issued under the provisions of s2 of the 2021 Act. [10]
Cognitive Bias	A pattern of deviation in judgement whereby inferences about other people and situations may be drawn in an illogical fashion. These include, expectation, confirmation, contextual and motivational biases, anchoring effects or focalism (related to expectation and confirmation biases), role effects (e.g. adversarial roles) and reconstructive effects (rely on memory rather than contemporaneous notes).
Competence	The skills, knowledge and understanding required to carry out a role, evidenced consistently over time through performance in the workplace. The ability to apply knowledge and skills to achieve intended results.
Complainant	A person who makes a complaint or allegation that a criminal offence has, or may have, occurred.
Complaint	In relation to the work of a forensic unit means any expression of negative feedback.
Compliance Action	Action taken by the Regulator under the provisions of ss6-8 of the 2021 Act. [10]
Consumable	Materials (other than items/exhibits), including equipment and chemicals, which are either consumed or used once and disposed.
Contaminant	Any substance not relevant to examination and/or analysis of a particular evidence type, but that is present on the item/exhibit and may interfere with the examination/analysis.
Contamination	The undesirable introduction of material to an item/exhibit or sample which is to be examined/analysed.
Control Sample	A matrix-matched standard used to determine the linearity and stability of a quantitative test or determination over time, prepared from a reference material (weighed or measured separately from the calibrators), purchased or obtained from a pool of previously analysed samples. A positive control contains the analyte at a concentration above a specified limit. A negative control contains the analyte at a concentration below a specified limit. The term is used in the forensic science context to refer to a sample obtained from a

[228] For example, a certificate under the provisions section 16 of the Road Traffic Offenders Act 1988 [73] can be used to establish the concentration of alcohol in samples.

	known source against which material from an unknown source (recovered sample) is to be compared to consider the strength of the evidence in support of a common origin.
Controlled Drug	Any substance which is listed (by name or by virtue of its chemical structure) in any Schedule to the Misuse of Drugs Act 1971. [90]
Core Code	The content of this Code except that contained in an Appendix to the Code.
Coroner	Any person falling within the classes below. a. The Chief Coroner. b. A person holding the position of Senior Coroner, Area Coroner or Assistant Coroner under the provisions of the Coroners and Justice Act 2009. [132] c. Any person exercising the functions of a coroner in a particular case.
Criminal Investigation	Anything falling within the definition of 'detecting and/or investigation of crime' in section 42.2.3 of this Code.
Criminal Justice System	This comprises the structures in place in England and Wales to detect/investigate crime, prosecute criminal offences, investigate potential miscarriages of justice and consider any appeals against conviction and/or sentence. It does not cover the systems and/or processes which deal with the punishment and/or rehabilitation of convicted persons.
Criminal Proceedings	A proceeding falling within the definition in section 42.3.3 of this Code.
Critical Conclusions Check	A check on work undertaken as part of an FSA to ensure the following. a. The work done addresses the required issues. b. The work done is rational and the results justify the content of the report and the opinions provided. c. The report properly sets out the work done, the observations and the opinions. It does not involve re-doing any of the work or going back to assess instrumental output etc.
Critical Data	In this document, this is data which is identified during the risk assessment process as crucial to the method and/or finding, particularly in terms of the accuracy or traceability and the therefore protection steps should be in place to reduce the risk of irretrievable loss or data corruption.
Critical Findings	While the term is used in ILAC-G19 [3] the term Critical Observations is used in this Code.
Critical Findings Check	See Critical Observations Check.

Critical Observations	Observations or results that meet one or more of the following criteria. a. Have a significant impact on the opinion provided. b. Cannot be repeated or checked in the absence of the item/exhibit or sample. c. Could be interpreted differently by a suitably qualified practitioner in the FSA in question.
Critical Observations Check	A check on any critical observation to ensure they are acceptable.
Complainant	A person who makes a complaint or allegation of having been the victim of a criminal offence(s). Also See Patient.
Data	Information which in the context of clauses in this document referring to protection or loss is not restricted to inputs or readings and may include all information, particularly when stored electronically (e.g. a QMS document when on a sever is data, but it would rarely be referred to as data if printed or even while being viewed).
Database	A collection of information (often but not exclusively electronic) in a structured format allowing searching which may be used for purposes of interpretation.
Dedicated Facilities	A site (whether permanent or temporary), or part of a site, owned or controlled by the forensic unit which is routinely used for undertaking one, or more, FSAs.
Detection and/or Investigation of Crime	Anything falling within the definition in section 42.2.3 of this Code.
Detainee	Any person detained (whether arrested or not) by a law enforcement agency as part of the investigation/prosecution of crime.
Developmental Validation	The validation typically performed on a new or novel methodology (typically by the developer of the method but) sometimes involving collaboration on aspects of the validation study by the community depending on the scale required e.g. introduction of a new DNA analysis chemistry.
Digital Metadata	The file system information of the file, any other external information about the data e.g. an image file and any data contained in the image file beside the pixel data.
Disposable Equipment	A sub-class of consumable. Equipment which is used once and then disposed of.
DNA Artefact	Artefacts are ‘nuisance’ peaks in a profile; often associated with the amplification and detection processes, such as spikes, dye blobs, spectral pull-up. They do not represent genuine alleles.
DNA Clean Area	Area in which appropriate DNA contamination prevention measures shall be maintained at all times.
DNA Profile	This is a format for the representation of an individual’s genetic information that can be compared to other profiles, for example stored on a database.

Drop-in	Additional random alleles present in a profile originating from random fragmented sources and regarded as independent events.
Drug	Any substance which has a physiological effect when introduced to the human body.
Effective Date	The date on which this issue of the Code became effective. See section 10.1.3.
Elimination Database	Collection of DNA profiles or fingerprints held in a searchable format from personnel and visitors (e.g. service engineers) whose access/role/activities are deemed to be a potential contamination risk. The data are used to identify instances of inadvertent contamination.
End User	Anyone who works within a forensic unit or the Criminal Justice System who will receive the output from a forensic unit.
England	“England” means, subject to any alteration of boundaries under Part IV of the Local Government Act 1972 [133], the area consisting of the counties established by section 1 of that Act, Greater London and the Isles of Scilly. See the Interpretation Act 1978. [15]
Enhancement	The application of process(es) to reveal additional detail or make that which is already visible more readily distinguishable from the background.
Environmental Monitoring (EM)	A sampling and analytical process for equipment used, furniture and work areas that both monitors the cleaning procedures and decontamination methods applied.
Error	Anything which affects the accuracy and/or precision of an observation.
Evaluative Opinion	An opinion on the value of the observations, based upon a pair of case specific propositions and clear conditioning information (framework of circumstances) that is provided for use as evidence in court (other than as agreed facts). In this Code the term refers only to opinions based on propositions at the activity, source and sub-source level as defined.
Evidence	Anything which is (or may be) admissible in criminal proceedings to assist the court in making any decision. This includes physical items/exhibits and information. The convention has been adopted that the ‘evidence’ will be used to describe the reporting of the facts and opinions related to observations to the CJS.
Evidence of Fact	Evidence which contains statements of fact only.
Evidence of Opinion	Evidence which contains opinion.
Examination	The convention has been adopted that the term ‘examination’ refers to the investigation of an item, person or location with the intention of locating, identifying and recovering material or information of interest. The term ‘analysis’ refers to any form of test, comparison or analytical

	method performed on an item or relevant material recovered from an item. The information produced by examination and analysis shall be collectively referred to as ‘observations’.
Examination Strategy	A documented plan of work designed to meet the needs identified through Case Assessment. [229] Although the terms examination and analysis have been defined to mean different things in this document.
Exhibit	A sub-class of item which is presented or identified as evidence in a court of law.
Exigent Circumstances	Exigent circumstances are circumstances which (a) could not have been prevented by reasonable preparation and (b) would cause a reasonable practitioner to believe that prompt action was necessary to prevent physical harm to persons, prevent crime, prevent destruction of relevant evidence, and/or frustrating the interests of justice. Exigent circumstances persist only until it becomes practicable to return to the use of normal methods. [230]
Expert	A practitioner who is competent to provide evidence of opinion in the Criminal Justice System in relation to an FSA.
Explanation	A proposition (theory) that can account for scientific observations. It is formulated after the scientific observations have been obtained and may be useful in generating investigative opinions.
Externally Provided Services	Any service provided to a forensic unit from outside the forensic unit.
Fact	A truth known by actual experience or observation; something known to be true.
Fact in Issue	Those purported facts that the prosecution is required to prove or disprove in order to establish the guilt of the accused and those facts the defence asserts or seeks to put in play.
Femtocell	A femtocell is a low-power cellular base station serving a small area such as a home, office or small business.
Fire and Rescue Service	Any service maintained by a Fire and Rescue Authority under the provisions of the Fire and Rescue Services Act 2004. [134]

[229] The term ‘examination strategy’ has been used for some time to cover all work planned in the case and will be used in that sense in this document.

[230] This definition is based on Unites Stated of America v. McConney 728 F.2d 1195.

Forensic DNA Grade	DNA Consumables that are compliant with the requirements set out in PAS 377 and/or ISO 18385:2016. [110]
Forensic Healthcare Practitioner	The term is used to describe forensic physicians (e.g. paediatricians), forensic nurses, forensic midwives and paramedics.
Forensic Medical Examination	Activity or process of observing, assessing, prioritising, recording, collecting samples for scientific analysis, documenting injuries, and interpreting with reference to sexual offences.
Forensic Science Activity	Any activity falling within the definition in s11 The Forensic Science Regulator Act 2021. [10]
Forensic Science Activity Subject to the Code	Any FSA for which the FSA definition in the appendix to this Code states that compliance with this Code is required.
Forensic Science Regulator	The Forensic Science Regulator appointed under the provisions of the Forensic Science Regulator Act 2021. [10]
Forensic Unit	A legal entity or a defined part of a legal entity that performs any part of an FSA. See ILAC-G19. [3] [231]
Ground Truth	A data set made from known source material, such as DNA extracted and analysed from stains produced using body fluids from known donors, used for validation, proficiency and competency testing purposes.
Haplotype	A group of alleles that are inherited together from one parent. The Y-chromosome represents a single haplotype inherited from father to son.
Human Biological Material	Any material which originated (or is believed or suspected to have originated) from a human body, or any part thereof, regardless of whether the person was alive at the time the material was separated from the body. For the avoidance of doubt, any material within the digestive tract is not to be considered as biological material.
Human Body Fluids	A sub-set of 'human biological material', which includes, blood, semen, saliva, vaginal secretions, lymph, cerebrospinal fluid and vitreous humour.
Ignitable Liquid	Any liquid that is capable of burning and has a measurable flash point. A flash point is the lowest temperature at which a liquid will give off sufficient vapour to momentarily support a flame
Image Enhancement	A transformation of a pictorial image that seeks to increase the value of the information of interest that potentially diminishes other information. Enhancement may actually reduce the information content of the imagery but can aid its interpretation.

[231] Historically the term 'forensic science provider' has been used. This is not considered appropriate as a forensic unit is often a sole practitioner, small group which may, for accreditation purposes, may be viewed as a legal entity.

Imagery	A general term that denotes still and/or video images.
Infrequently Commissioned Expert	A person falling within the definition of ‘infrequently commissioned experts’ in section 40 of this Code.
Infrequently Used Method	A method falling within the definition of ‘infrequently used methods’ in section 28.3.50 et seq. of this Code.
Inspection	Examination of a product design, product, process or installation and determination of its conformity with specific requirements or, on the basis of professional judgment, with general requirements. Inspection of a process may include inspection of persons, facilities, technology and methodology. [19]
International Standard	A standard published by the International Organization for Standardization.
Interpretation	The consideration of the observations from the work implementing the examination strategy. Interpretation may be investigative, evaluative or, in certain circumstances, categorical.
Investigation	When referring to action by the Regulator means an investigation employing powers under s5 of the 2021 Act. [10]
Investigative Opinion	An opinion that arises in casework and in which explanations are generated to account for observations. The provision of an explanation for an observation is termed an investigative opinion.
Item	Anything that is submitted, recovered, collected, sampled or derived as part of the forensic process.
Lachrymator	A substance likely to be used in an attack on the person with the intent of causing irritation to the eyes. The following are examples of lachrymators. a. (6E)-N-[(4-Hydroxy-3-methoxyphenyl)methyl]-8-methylnon-6-enamide. b. N-[(4-Hydroxy-3-methoxyphenyl)methyl]nonanamide. c. (2-Chlorophenyl)methylidene]propanedinitrile. d. Dibenzo[b,f][1,4]oxazepane. e. 2-Chloro-1-phenylethan-1-one. f. (phenacyl chloride) g. 1-Bromopropan-2-one. h. xylyl bromide.
Law Enforcement Agency	A body defined as a Law Enforcement Agency in section 42.2.4 of this Code.
Medical Practitioner	See Registered Medical Practitioner
Method	A logical sequence of operations, described generically for analysis (e.g. for the identification and/or quantification of drugs or explosives, or the determination of a DNA profile) or for comparison of items to establish their origin or authenticity (e.g. fingerprint/footwear mark/toolmark examination; microscopic identifications).

Miscarriage of Justice	This term covers the following. a. An unsafe conviction. b. A wrongful acquittal. c. The inability to bring an offender to justice. d. Delaying bringing an offender to justice. e. The inability to clear the innocent. f. Delaying the clearing of the innocent.
Non-Conformity	The non-fulfilment of a requirement, either within the forensic unit's policies, procedures or in the specification of the commissioning party.
Non-Dedicated Facilities	A facility (whether permanent or temporary) where an FSA is undertaken which falls within a description below. a. Is not owned or controlled by the forensic unit. b. Is not routinely used for undertaking an FSA.
Non-Statutory Forensic Science Regulator	The role which operated before the creation of the Forensic Science Regulator under the provisions of the 2021 Act. [10]
Observation Check	A check that observations being recorded by a practitioner are acceptable (e.g. that the interpretation of the output from a method are sound). [232]
Observations	The results of the examination and analyses carried out according to the documented examination strategy.
Off-Site	Away from the dedicated facility (or if authorised, the non-dedicated work area (see 27.1).
Opinion	An inference drawn from perceived facts (based on views from a legal standpoint [135]).
Pathologist	A registered medical practitioner who holds, or is working towards obtaining, specialist registration with the General Medical Council as a histopathologist or forensic pathologist.
Patient	In the context of 'Sexual Assault Examination: Requirements for the Assessment, Collection and Recording of Forensic Science Related Evidence' (see section 98), a patient is an individual subjected to or suspected of being subjected to a sexual offence(s).
Peer Review	A complete check of the work done and involves reviewing all of the analytical work. It does not include re-analysing the items/exhibits etc.
Person	Any person including a body of persons corporate or unincorporate. See Interpretation Act 1978. [15]

[232] For example that the output from an IR spectrometer indicates the analyte is comprised of polyester.

Personnel	Any person working within a forensic unit (whether employed by the forensic unit or not). [233]
Personal Protective Equipment (PPE)	Barrier clothing and gloves that are used to prevent skin and mucous membrane exposure when in contact with blood and body fluid on or from any person. PPE is also worn to protect the practitioner from contact with harmful chemicals, for example, during decontamination and to minimise the chance that the wearer causes inadvertent contamination.
Post Mortem Examination	Any work, related to the examination of a deceased person for the purposes of. a. The identification of the deceased. b. The determination of the cause of death. c. The circumstances of how the deceased came to die. The collection of items/exhibits or information which may assist in any investigation by a coroner or a law enforcement agency.
Practitioner	A person in a forensic unit (whether an employee of that unit or not) who is directly involved in undertaking an FSA.
Precision	Closeness of agreement between independent test results obtained under prescribed conditions. [130]
Primary Review	A review which occurs as part of the originally commissioned work by a forensic unit.
Proceedings	Proceedings before a judicial authority includes, in addition to proceedings before any of the ordinary courts of law, proceedings before any tribunal, body or person having power— a. By virtue of any enactment, law, custom or practice; b. Under the rules governing any association, institution, profession, occupation or employment; or c. Under any provision of an agreement providing for arbitration with respect to questions arising thereunder; to determine any question affecting the rights, privileges, obligations or liabilities of any person, or to receive evidence affecting the determination of any such question. See s5(11) of the 2021 Act [10] and s4(6) of the Rehabilitation of Offenders Act 1974. [136]
Proficiency Test (PT)	The determination of the testing performance of a forensic unit, i.e. tests to evaluate the competence of practitioners (analysts) and the quality performance the forensic unit. These tests can vary:

[233] The term covers practitioners (i.e. those directly involved in undertaking an FSA) but also covers others (such as administrative staff, site support staff etc).

	a. External proficiency test: a test conducted by an agency independent of the practitioners (analysts) or laboratory being tested. b. Blind or undeclared proficiency test: a test in which the practitioners (analysts) are not aware that they are being tested; and c. Open or declared proficiency test: a test in which the practitioners (analysts) are aware that they are being tested.
Proof Read	A check to ensure a document is properly written and that the English and grammar are acceptable.
Proposition	A statement that is either true or false and is generated, in part, from the background information but may also depend upon the observations that have been made at the alleged crime scene (or other information obtained before the consideration by the expert). In the context of a criminal trial there will most often be a pair of propositions - one representing the prosecution's position, the other representing the defence's position in relation to a particular issue. Propositions shall be mutually exclusive (i.e. if one is true then the other must be false) and will often, but not always, be exhaustive (i.e. they cover all possibilities within the framework of circumstances of the case).
Prosecuting Authority	A body defined as a prosecting authority in section 42.2.5 of this Code.
Psychoactive Substance	Any substance which is a psychoactive substance within the provisions of the Psychoactive Substances Act 2016. [91]
Qualitative	A description of an examination/analysis which results in observations which can not be expressed numerically.
Quality Management System	Documentation of a forensic unit's policies, systems, procedures and instructions to the extent necessary to assure the quality of its results, to meet relevant jurisdictional, regulatory and safety requirements and to satisfy the needs of the clients. It covers the overall activities of the unit, including sampling, analysis and reporting, whether these are within the main unit facility itself, mobile/temporary facilities, or external locations such as a clandestine laboratory, the roadside, or the locus of a large drug seizure. [130][234]
Quantitative	A description of an examination/analysis which results in observations which can be expressed numerically.

[234] As a minimum the quality management system must contain all policies and procedures which are required to ensure compliance with this Code (a) is achieved and (b) can be demonstrated.

Radio Frequency Propagation Survey	A survey that captures details of cell coverage and/or the cells that can be detected at specific locations using equipment ranging from phones with specific applications and phone emulators to scanners. The closeness to the time of the event of interest and the survey strategy may dictate the overall usefulness of the survey to the investigation.
Reagents	A substance used in a chemical reaction.
Reference Collection	A collection of material or information (whether physical or electronic) which is maintained by a forensic unit to support the undertaking of any FSA.
Reference Sample	A sample obtained from a known person, location or item when analysed is used for the purpose of comparison against an unknown questioned or casework sample.
Reference Material	A quality control material or substance, traceable to its source, one or more of whose property values are sufficiently homogeneous and well established to be used for the calibration of an apparatus, the assessment of a measurement method, the correct functioning of reagents, or for assigning values to materials.
Registered Medical Practitioner	A fully registered person within the meaning of the Medical Act 1983 [137] who holds a licence to practise under that Act. See Interpretation Act 1978. [15]
Regulator	The Forensic Science Regulator appointed under the provisions of the 2021 Act. [10] See also Non-Statutory Forensic Science Regulator.
Replay Software	Proprietary replay software that has been developed and distributed by the system's manufacturer to be compatible with the codec used to encode/decode their video format.
Report	Any written document (including certificates, SFR and statements) setting out the practitioner's observations conclusions and/or evidence. A statement admissible under s9 Criminal Justice Act 1967 [138] is one form of report.
Reverse Engineering	Reverse engineering is the process of deconstructing and interpreting an electronic device or data format without prior access to the creator's specification or design.
Re-Working	A complete repetition of the work undertaken in an FSA or part of an FSA.
Sample	A part of an item/exhibit, reference material which is selected for examination/analysis.
Schedule of Accreditation	A document issued by the national accreditation organisation specifying the examinations or tests the organisation has been accredited for, and for which it could issue certificates or reports bearing the testing mark.

Secondary Review	A review undertaken by a forensic unit other than that which undertook the work being reviewed. [235] See also Primary Review.
Senior Accountable Individual	A role to be filled in each forensic unit as a result of section 16.2 of this Code.
Sexual Offence	An offence contrary to the provisions of the Sexual Offences Act 2003 [139] and any offence which is related to an offence under the Act (e.g. conspiracy, attempt, assisting or encouraging).
SFR	A case management procedure for producing scientific evidence at court whilst seeking to reduce unnecessary costs, bureaucracy and delays in the Criminal Justice System.
SFR1	An SFR which is intended to provide a summary of the practitioner's evidence. A SFR1 is not admissible as evidence other than as agreed fact.
SFR2	An SFR, normally issued after questions have been raised about information provided in an SFR1.
Short Tandem Repeat (STR)	A short repetitive DNA sequence where the repeats are adjacent to each other.
Sporadic Contamination	Unpredictable, erratic contamination event of unknown cause during examination and/or analysis. This may arise due to contamination of consumables which is not detected by quality control batch testing of those consumables prior to use in an FSA.
Standard Method	A 'standard method' is published by certain prescribed organisations and has the following characteristics. It a. contains concise information on how to perform the tests; b. does not need to be supplemented or rewritten as internal procedures; and c. can be used as published by the operating personnel in a laboratory. Even if a method were to be recognised as standard, the requirement is for the forensic unit to demonstrate with objective evidence that it is appropriate/valid and verify it can properly perform the method to achieve the required performance.
Standard Operating Procedure	A written procedure that describes how certain examination or test activities are carried out in a given forensic unit.
Standards of Conduct	The standards of conduct contained in section 14of this Code.
Standards of Practice	The standards of practice set out in sections 15to 39of this Code.
Statement (CJS)	One form of report which complies with the provisions of s9 Criminal Justice Act 1967 [138].

[235] A defence examination of one form of secondary review.

Substantial Risk	A risk which is more than remote. In Her Majesty's Attorney-General v Express Newspapers [2004] EWHC 2859 (Admin), discussing the same term as it is used in s2 Contempt of Court Act 1981 [140] the Court stated: ‘Substantial risk’ … means a risk which is more than remote (Attorney-General v English …) or "not insubstantial" (Attorney-General v News Group [1987] QB 1 … or, as … prefers to express it, "real". The risk must be practical and not theoretical (Attorney-General v The Guardian [1992] 1 WLR ...’
Technical (Factual) Reporting	The reporting of observations based solely on the technical competence of the individual. No inferences/explanations (opinion) are drawn from the observations. An example would be where a digital forensics practitioner has used a specified software tool to extract data from a mobile phone. A factual report explains what the practitioner has done and the observations obtained, such as a list of the files of a certain type that were retrieved. It offers no opinion on how the files came to be on the device or whether any of their content is relevant to a fact in issue in the case.
Testing	The determination of one or more characteristics according to a procedure and although typically quantitative, it can be qualitative (e.g. a presumptive test with a colour change). [19]
Timed Expiry	A feature of DVRs that allows the equipment to adhere to data retention policies that may be mandated in certain parts of the world and that result in video data becoming inaccessible after a certain date. This may happen even when the DVR is switched off.
Tracking	In the context of video, moving objects or people are often tracked through a scene by applying arrows or highlights on a digital editing suite in order to draw attention to the object or person of interest.
Transcription Check	A check to ensure that any data transferred between any records and/or systems has been transferred correctly.
Transcoding	The process of converting a file from one form of coded format to another.
True Value	Value that characterizes a quantity perfectly defined in the conditions which exist when that quantity is considered. The true value of a quantity is an ideal concept and, in general, cannot be known exactly. [130]
Uncertainty of Measurement	The estimation of the uncertainty of measurement is a Codes and accreditation requirement and is based upon the principle that all measurements are subject to uncertainty and that a value is incomplete without a statement of accuracy. Sources of uncertainty can include unrepresentative samples, rounding errors, approximations and inadequate knowledge of the effect of external factors.

Validation	The process of providing objective evidence that a method, process or device is fit for the specific purpose intended.
Verification	Confirmation, through the assessment of existing objective evidence or through experiment that a method, process or device is fit (or remains fit) for the specific purpose intended. The forensic unit must demonstrate the reliability of the procedure in-house against any documented performance characteristics of that procedure.
Video Transformation	Any process that alters the format or information content of video (e.g. transcoding, enhancement, printing, rendering to computer display). Many transformations add or remove information from the video material.
Wales	“Wales” means the combined area of the counties which were created by section 20 of the Local Government Act 1972 [133], as originally enacted, but subject to any alteration made under section 73 of that Act (consequential alteration of boundary following alteration of watercourse). See Interpretation Act 1978. [15]
Wi-Fi	A local area network that uses high frequency radio signals.

110. Correlation with Key Clauses in this Code with Normative References [236]

		Codes of Practice and Conduct: Issue 7 [237]	ISO 17025: 2017	ISO 15189: 2012	ILAC-G19: 06/2022	ISO 17020: 2012	UKAS-RG 201: Edition 2
14	Standards of Conduct	Code of Conduct	-		3.4	-	6.1.10
9	Overview of FSAs and Requirements	Statement of Standards and Accreditation Requirements	-	-	-	-	-
11.2	Normative References	4	2	2	-	2	-

[236] Cross references to some of the key clauses that appear in the normative references with cross references to the non-statutory Forensic Science Regulator's Codes of Practice and Conduct for ease of reference for forensic units which have previously incorporated those requirements into their quality management system. Clauses in other documents may also be relevant (e.g. ILAC-P15 [81], UKAS LAB 13 [74]).

[237] Cross references to the non-statutory Forensic Science Regulator's Codes of Practice and Conduct are for ease of reference, these Codes are not normative in this Code.

		Codes of Practice and Conduct: Issue 7 [237]	ISO 17025: 2017	ISO 15189: 2012	ILAC-G19: 06/2022	ISO 17020: 2012	UKAS-RG 201: Edition 2
16	Management Requirements	6	8	4, 4.1, 4.2	-	5.1, 5.2, A1	5, 6
17	Business Continuity	7	-	-	-	-	-
18	Independence, Impartiality and Integrity	8	3.1, 4.1	4.1.1.3	2.12, 3.4, 4.8.1	4.1, 5.2.1	4.1, 6.1.10
19	Confidentiality	9	4.2	4.1.1.3, 5.1.5, 5.2.2	3.4	4.2	4.2
20	Document Control	10	8.2 (option A)	4.3	3.1	8.3	8.3
21	Review of Requests, Tenders and/or Contracts	11	6.4, 6.5, 6.4.1, 6.6, 7.3.3, 7.6.2,7.7.1, 7.10	4.4, 4.7	3.2	7.5, 7.6	7.5, 7.6
22	Externally Provided Products and Services	12, 13	6.4, 6.5, 6.4.1, 6.6, 7.3.3, 7.6.2, 7.7, 7.10	4.6, 5.3	3.12, 4.1.3	6.1, 6.2, 6.3, 7.1	6.2
23.1	Control of Non-Conforming FSA Related Work	15	7.1	4.9	3.9	8.7, 5.2	8.7

		Codes of Practice and Conduct: Issue 7 [237]	ISO 17025: 2017	ISO 15189: 2012	ILAC-G19: 06/2022	ISO 17020: 2012	UKAS-RG 201: Edition 2
23.2	Complaints	14	7.9	4.8	3.2	7.5, 7.6	7.5, 7.6
24	Control of Records	16	6.6.2,7.1., 7.2.1.5, 7.2.2.4, 7.3.3, 7.4.2, 7.5, 7.8.1.2, 7.10.2, 8.4	4.13	3.5	7.1, 7.2, 7.3, 8.4	7.3, 8.4
24.3	Checking and Primary Review	16.3	7.8.1.1	4.14	4.7.5, 4.8.2	4.1, 7.3	15.3, 25
25	Internal Audits	17	8.8 (option A), 8.9 (option A)	4.14	3.7	6.1, 8.6	8.6
26	Personnel Requirements	18, 19	6.1, 6.2	4.4, 5.1, 5.5, 5.5.1	3.3, 6.2	6.1	6.1
27	Environment where the FSA is Undertaken	20	6.3, 7.8.3.1, 7.8.5	5.2	3.11, 4.2.3	6.2, 7.2, 7.3	6.3
28	Methods and Method Validation	21	7.2	4.4, 5.4.2, 5.5	3.1	7.1	6.2.2, 7.1
29	Estimation of Uncertainty	22	7.6	5.5.1.4, 5.5.2	3.10, 4.9	6.1.3, 7.1.2	

		Codes of Practice and Conduct: Issue 7 [237]	ISO 17025: 2017	ISO 15189: 2012	ILAC-G19: 06/2022	ISO 17020: 2012	UKAS-RG 201: Edition 2
30	Control of Data	23	6.4, 6.5, 6.4.1, 6.6, 7.3.3, 7.6.2,7.7.1, 7.10	4.13, 5.10, 5.10.1, 5.10.2, 5.10.3, Annex B	3.12	6.1, 6.2, 7.1	8.3, 8.3
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33	Measurement Traceability - Intermediate Checks	25	6.4.10, 7.7.1	5.3.1.4	4.3	6.2.9	6.2.9
34	Handling of Items/Exhibits	26	7.3, 7.4	5.25, 5.4.3, 5.4.4.3 , 5.4.5, 5.4.6, 5.4.7	4.3.3	7.2	7.2
35	Assuring the Quality of Results	27	7.7	5.6	4.7.7.2	7.1, 7.2	
36	Reporting the Results	28	7.8	5.7, 5.8, 5.9	4.9	4.2, 6.1,7, 7.4	7.4
39	Demonstration of Compliance	Statement of Standards	-	-	-	-	-

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