



Fingerprint Quality Standards Specialist Group (FQSSG)

Notes of the meeting held on 8 June 2016
at Room 4.035-36, Block B, 109 Lambeth Road, London, SE1 7LP

1.0 Welcome, Introduction and Apologies

1.1 The Chair, Gary Pugh, welcomed all to the meeting. A full list of attendees and apologies is provided at Annex A. The Chair also welcomed Christophe Champod from Lausanne University to his first meeting of the FQSSG.

2.0 Minutes of the last FQSSG meeting on 25 February 2016

2.1 Amendments to the minutes had been submitted. Apart from these amendments the minutes were approved as an accurate reflection of the discussion held and the Secretariat was asked to publish the minutes.

Action 1: Secretariat to make amendments to the minutes of the meeting held on 25 February 2016 and then publish them.

3.0 Actions and Matters Arising

3.1 The action to publish the Information Fingerprint document for court was discussed and members had been provided with an updated version. The group were informed that this document contained basic information which fingerprint experts could adopt and customise for their own use and also contained important aspects of the Regulators standards within it. The document was signed off by the group and it was agreed that the document should be sent to Neil Denison as chair of the Fingerprint Strategic Network (FSN) for feedback, to the National DNA Database (NDNAD) Strategy Board (SB) for information and then published as an appendix to the Forensic Science Regulator's (FSR) Codes of Practice & Conduct for Fingerprint Comparison (FSR-C-128). It was requested that the final version also be placed on the Crown Prosecution Service (CPS) website.

Action 2: Secretariat to send the Information Fingerprint document for court to Neil Denison and request feedback. Document then to be sent to the Strategy Board for information.

3.2 The External Review framework, which was a document setting out a structured framework for handling significant differences of opinion for fingerprint interpretation, had been circulated to the members of the Forensic

Science Advisory Council (FASC) and the Fingerprint Governance Group (FGG). No feedback had been received. It was queried who would have oversight of the framework once operational and it was noted that the document states that the FGG and the Strategy Board were better placed to have oversight of the process. Members were requested to review the document and feedback prior to it being published as an appendix to the FSR's Code of Practice & Conduct for Fingerprint Comparison.

Action 3: Members to review the External Review Framework document and feedback to June Guinness.

3.3 The outstanding action for Karen Georgiou and Neil Denison to update on the testing of the calibrated metric scales on live fingerprints processing work was discussed. This is a mechanism for testing the quality of images as they are captured and processed. The work was still on-going due to delays with the arrival of the calibrated metric scales. The group heard that the work would involve testing the calibrated scale using current equipment and processes. A comparison of results from both sites would be undertaken at the end of the trial and an update would be provided at the next meeting.

Action 4: Karen Georgiou and Neil Denison to update on the progress of testing of the calibrated metric scales at the next meeting.

3.4 The group discussed an outstanding action in relation to the FQSSG being invited to provide input to the Home Office's assessment of the next generation Automated Fingerprint Identification System (AFIS) algorithms. It was highlighted that the next generation of AFIS algorithms must be tested using datasets of known source fingerprint data i.e. ground-truth dataset, to ensure that the accuracy, precision, strengths and weaknesses of the algorithms were tested.

3.5 The group were aware of two approaches which had been explored to develop databases of ground-truth data in order to test the next generation of AFIS algorithms. The Centre for Applied Science & Technology (CAST) within the Home Office had been working on a collaborative approach to build a ground-truth database at a national level and had been given permission to scope out the work. However, it was thought that this work would only provide the specifications for the ground-truth database and the details of how it should be formed but would not provide the dataset. A further approach was outlined which was being organised by colleagues from the Thames Valley fingerprint bureaux included assessing the fingerprint landscape for pockets of ground-truth data which exists in bureaux, with the view to pulling all the data together.

3.6 The outstanding action for the FQSSG to review the report into errors occurring on IDENT1 as a result of corrupted files was discussed. It was thought that a report had been circulated to those affected however it was confirmed that the FGG had not received a report into the errors. It was agreed that the group would seek a response from the Regulator in relation to the investigation into the errors. In addition, the User Group for IDENT1, which

collates issues on a regional and national basis should have received feedback about the errors and Iain Borthwick agreed to seek feedback from this group.

Action 5: June Guinness to seek a response from the Regulator in relation to the investigation into errors occurring on IDENT1 as a results of corrupted files.

Action 6: Iain Borthwick to find out if the National User's Group for IDENT1 had received feedback about the errors occurring on IDENT1 as a result of corrupted files.

4.0 Presentation on Fingerprint Development Update by Professor Christophe Champod from Lausanne University

4.1 Professor Christophe Champod from Lausanne University in Switzerland provided a presentation on improved finger-mark detection techniques, tools to assist fingerprint examiners during the identification process and light-out transactions¹ from marks. The group heard the following:

- Future imaging systems and detection techniques would rely upon methods which utilised much broader wavelengths ranges, for example, UV, NIR, up-conversion and hyper-spectral imaging. Professor Champod provided examples of detection techniques that himself and colleagues were developing;
- Statistics were being developed to provide examiners with tools to enable them to determine which finger a mark is likely to have originated from. The tools made use of general patterns within fingerprints in order to make the assessment and would assist fingerprint examiners to make informed decisions;
- Further tools being developed included approaches to define sufficiency which included determining the objectives of the examiner and were also dependent upon the complexity of the mark and the AFIS algorithm which was utilised. Approaches which had been undertaken to map the decision processes made by examiners when comparing fingerprints were described and it was noted that the maps made by examiners were not predictive and were usually made to post rationalise a decision that had already been made;
- The group heard about processes for resolving differences in opinions in relation to fingerprint comparisons. If two experts were to be involved, these can be resolved by discussions, however the opinion of the more experienced expert should not be taken over and above the

¹ Light-out transactions are automated fingerprint comparisons which involve no manual interventions.

opinion of the least experienced expert. Where statistical tools are utilised for fingerprint comparisons, then the models would need to be included in the resolution processes for differences in opinions;

- Finally, details were provided about two lights-out AFIS systems which contained results based on ground-truth datasets, complimented by known data. The proportion of times the system returned the correct candidate as the first candidate was determined. The quality of the system was determined and whether there was a relationship between the quality of the system and the efficiency of the AFIS system.

4.2 The group discussed the possibility of the introduction of statistics and likelihood ratios in order to present fingerprint results in court. The importance of the experts being able to understand and articulate the results was noted. It was also noted that the algorithms had been designed to return corresponding marks and consequently they were very poor at making exclusions. Therefore, there is a clear interplay between the expert and the system and this relationship would need to be clarified if statistics and likelihood ratios are to be used in the future.

4.3 The major challenges for this group were discussed and it was thought that there would be a focus on the validation of the next generation AFIS algorithms and for fingerprint bureaus to achieve accreditation to ISO 17025 with the new generation algorithms. The new generation AFIS algorithms were expected to be delivered in 2018/19 and as part of their delivery they would need to be validated.

4.4 Further work the group predicted was the move towards the use of statistical evaluation of marks in court. Members were as yet unaware of any occasions when statistical tools had been used in the courts and the necessity to implement statistical evaluations carefully was noted. It was suggested that an initial focus for use of statistical evaluations might be in cases where it would add value to the criminal justice system, for example, with prints which are relatively difficult to interpret. However, concerns were raised that once statistical evaluations are introduced for certain types of fingerprint casework there is a high possibility that experts would be asked for these evaluations in other casework and therefore it would be necessary to define its usage and the concept of operation associated with its use.

4.5 It was suggested that a piece of work needed to be undertaken to identify the underlying principles required for the validation of the use of statistical evaluations in fingerprint interpretations. Furthermore, it might be possible to draw on guidance documents published by the European Network of Forensic Science Institutes (ENFSI) and parallel work-streams within the FSR's DNA Analysis Specialist Group. It was noted that the Regulator had supported a request by CAST, at the latest FGG meeting, for the release of Intellectual Property by the Home Office in relation to statistical work undertaken by the Forensic Science Service on fingerprints, so that this data can be made available to academics and be further developed.

5.0 Work streams/ sub groups

Home Office Biometrics Program Update

5.1 The Home Office Biometrics program was considered and it was noted that the impact of new AFIS technology required broad considerations including potential changes to the police operating model not just changes to the forensic model. The impact of the new AFIS technology was expected to include rapid identification of finger-marks, an increase in the volume of identifications and an ability to make identifications from cold cases. The necessity for the group to engage with the Home Office was noted and to ensure that an effective quality standards framework was introduced. In order to facilitate the engagement between the Home Office and this group it was suggested that a representative from the Home Office be invited to sit on this group.

Action 7: The Chair to engage with the Home Office in relation to the next generation algorithms and invite a representative from the Home Office to sit on the FQSSG.

5.2 The group heard that representatives from the FQSSG and the Metropolitan Police Service had agreed to act as critical friends to the Home Offices Biometrics HOB Programme and their role will be to feed in the validation requirements of the Regulator taking into account user requirements, specifications and design to ensure that bureaus can gain accreditations to ISO 17025. This was seen as a very positive development and the chair recognised the leadership that Brendan Crean, the Programme Manager has brought to the HOB Programme.

Enhancement/Image Capture

5.3 The group had been provided with combined Appendix to the FSR's Codes of Practice & Conduct for Fingerprint Enhancement and Image Capture (FSR-C-127). It was agreed that Richard Small would undertake a critical review of the document and the whole of the group could also submit comments. The document would then be proof read and sent out for public consultation.

Action 8: Richard Small to undertake a critical review of the Appendix: Fingerprint Development and Enhancement Laboratories and feedback by 6 July 2016.

6.0 Accreditation Update

6.1 The group discussed the progress that had been made by bureaus towards achieving accreditation to ISO 17025 and who had oversight of the process. It was understood that the Performance & Standards Group had oversight of the collation of these details including anticipated timescales and key milestones and then updating the plans as they changed. It was thought that this group had a role to identify common issues and feed these back to

the Performance & Standards Group. Richard Small agreed to report back to the FQSSG the coordinated approach which had been decided upon in order to get all fingerprint bureaus accredited to ISO 17025. The involvement of the UK Accreditation Service (UKAS) in this work was emphasised and it was hoped that Katherine Monnery from UKAS or a representative would be able to attend the next FQSSG meeting.

Action 9: Richard Small to report back to the FQSSG, the coordinated approach which had been decided upon in order to get all the fingerprint bureaus accredited to ISO 17025.

6.2 The group heard that fingerprint bureaus in other countries, including Norway, Sweden, Finland, Switzerland and France, were moving towards gaining ISO 17025 accreditation for fingerprint comparison.

6.3 Discussions were held in relation to the Scottish Police Authorities accreditation to ISO 17025 which included the search of IDENT1 in their scope of accreditation. It was queried how the IDENT1 system could be accredited and if it can, why all police forces were not seeking accreditation of IDENT1. It was clarified that the accreditation of IDENT1 gained by the Scottish Police Authorities related to the processes around which IDENT1 was used and the procedures which were put in place to minimise risk. Christophe Champod reported that in his role as technical assessor for a number of laboratories, he had frequently been asked about the accuracy of current AFIS systems, given that they are not accredited using ground-truth data. He suggested that as the current AFIS system would be replaced in a few years, it was essential to focus on the accuracy of new systems which will replace the current system and ensure that the new system has a credible level of accuracy. At the next meeting it was decided that the group would hear about reflections from Gary Holcroft in relation to the Scottish Police Authority gaining accreditation to ISO 17025.

Action 10: Include in the agenda for the next meeting a reflection from Gary Holcroft in relation to the Scottish Police Authority gaining accreditation to ISO 17025.

7.0 AOB

Governance

7.1 The group heard that the National DNA Database Strategy Board (NDNAD SB) had recently been restructured to include fingerprints as well as the DNA database. The Chair of FQSSG informed the group that he had recently taken on the role of Chair to the NDNAD SB. The NDNAD SB is a stakeholder group which provides governance and oversight for the operation of the NDNAD. The group considered whether the same levels of governance were required for fingerprints as were required for DNA including; risk registers, registers of issues in provision of services and collation of

information on provider performance. The NDNAD SB monitors error rates in relation to the DNA database and consideration should be given to whether the SB should monitor errors with the fingerprint AFIS system. The current governance structures in place were considered including; the Fingerprint Strategic Network (FSN) which oversees projects and commissions research and escalates issues to the FGG. One of the FGG functions could be to further escalate fingerprint issues if they arise onto the Strategy Board. The group held the view that the current governance landscape was confused with a lack of clarity surrounding the purpose of the various groups, how the groups were linked and who is responsible for oversight of the development of their remits and outputs. Clarification was also required about how the FQSSG should link with these governance groups.

Action 11: The Chair undertook to speak with the Regulator and Home Office about these issues and reassured the Group that he would do his best to bring clarity to governance of forensic databases.

8.0 Date of next meeting

8.1 The dates for the next FQSSG meetings were confirmed as: 28 September 2016, 15 December 2016 and 23 March 2017.

Annex A

Present:

Gary Pugh, Chair	Director of Forensic Services, Metropolitan Police Service
Mark Bishop	Crown Prosecution Service
Iain Borthwick	Greater Manchester Police, Forensic Services Branch
Emma Burton-Graham	Science Secretariat, Home Office
Christophe Champod	Lausanne University
Karen Georgiou	Bedfordshire Police
June Guinness	Scientific Lead, Forensic Science Regulation Unit, Home Office
Lisa Hall	Metropolitan Police Service
Gary Holcroft	Scottish Police Authority
Richard Small	West Midlands Police

Apologies:

Apologies were received from:

Neil Denison	West Yorkshire Police
Katherine Monnery	United Kingdom Accreditation Service