Forensic Science International 275 (2017) 282–301

Contents lists available at ScienceDirect

Forensic Science International

journal homepage: www.elsevier.com/locate/forsciint

Review Article

ENFSI collaborative testing programme for fingermarks: Past experiences and future perspectives

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ARTICLE INFO

Article history:
Received 21 June 2016
Received in revised form 13 March 2017
Accepted 20 March 2017
Available online 27 March 2017

Keywords:
Fingermarks
Proficiency testing
Collaborative exercises
ENFSI EFP-WG

ABSTRACT

As early as 2004 the Fingerprint Working Group of the European Network of Forensic Science Institutes (ENFSI) has organised proficiency tests (PT's) as well as collaborative exercises (CE's) as a way of raising standards within the fingerprint profession.

Participation in PT's and CE's is a key element in the ISO/IEC accreditation process as they enable laboratories to monitor the quality of their analytical results. On the basis of the *European Council Framework Decision 2009/905/JHA, of 30 November 2009, on Accreditation of forensic service providers carrying out laboratory activities* [1], from November 15th of 2015, only accredited laboratories are allowed to exchange fingerprint data with other EU countries.

This article will provide an overview of the ENFSI collaborative tests for fingermarks in the fields of visualisation, imaging and individualisation. The characteristics of the testing programme are summarised, followed by an overview of the knowledge that has been gained, including lessons learnt. It is hoped that this reflective process can outline the critical issues that should be addressed as well as highlight future opportunities in relation to Monopoly Project 2013, "*Proficiency Tests and Collaborative Exercises for the Fingerprint Domain*".

Contents

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http://dx.doi.org/10.1016/j.forsciint.2017.03.010
0379-0738/

1. Introduction

The Council of the European Union [2], highlights the need to improve on the quality of forensic examinations. This paper focuses on the field of fingermark visualisation, imaging and individualisation and the work of ENFSI to meet this strategic challenge.

Moreover, the *Council Framework Decision 2009/905/JHA, of 30 November 2009, on Accreditation of forensic service providers carrying out laboratory activities* [1] established that, from the end of 2015, all European fingerprint service laboratories have to be ISO/IEC 17025 accredited to be able to exchange the results of their expertise within European Union Countries.

Therefore, the conduct of proficiency tests and collaborative exercises at international level has to be viewed as a mandatory activity. In fact, the accredited laboratories, following the requirements of ISO/IEC 17025:2005, are now tasked to demonstrate, in an objective way, the performance of their processes and their overall competence in producing consistent results; participation in recognised proficiency tests is as such seen as a mandatory element of the standard.

The availability and use of proficiency tests is at present very limited within the domain of fingerprints. There are only a handful of providers delivering proficiency tests and from a practitioners' viewpoint, as a result of group work during ENFSI Fingerprint Working Group (EFP-WG) meeting and on the basis of personal communications, the perceived quality of some of these tests are not regarded as sufficient [3,4].

It could be considered that the field of fingerprints is one of the most difficult domains in which to develop useful proficiency tests. Within the European Union alone, as a profession there are numerous reporting standards emanating from differing judicial systems, as well as complex mix of terminology. Moreover, the work of ENFSI has highlighted that there is a need to take into account the overall process of latent marks enhancement, imaging and analysis, and not simply concentrate efforts on the outcome of the individualisation process itself.

In 2004, the EFP-WG of the European Network of Forensic Science Institutes (ENFSI) initiated a collaborative testing programme for Working Group Members, both in the visualisation of latent marks and in the individualisation of marks through a known source. The purpose of this work is, therefore, to depict the previous experiences of ENFSI, emphasising the critical issues that should be addressed and outlining possible future opportunities in relation to Monopoly Project 2013 "*Proficiency Tests and Collaborative Exercises for the Fingerprint Domain*".

1.1. Definitions

The ENFSI Standing Committee for Quality and Competence (QCC) [5], helpfully provides the following definitions:

- Proficiency tests (PT's): tests designed to evaluate the participants' performance against pre-established criteria by means of inter-laboratory comparisons;
- Collaborative exercises (CE's): inter-laboratory comparisons designed to address specific issues (e.g. test of an analytical method). CE's are not designed to monitor laboratory performance of analysis or interpretation, but CE's may include monitoring of laboratory performance and/or interpretation;
- Provider: an organisation that takes responsibility for all tasks in the development and operation of a PT or CE scheme (an ENFSI member, commercial entity or a public body).
- Advisory group: a group who can advise on the design and implementation of the trial and on the assessment of the results (as a minimum specialist in the field, a person with competence in PT's and CE's, and if necessary a statistician)
- Participant: organisation/individual that receives test items as part of a PT or CE and submits results for review by the provider
- Pilot study: a trial run of the PT/CE organised by the co-ordinator to ensure that the PT/CE is appropriate prior to distribution to the participants.

1.2. Test types and issues

In general, it is possible to identify three main types of PT's/CE's in fingerprint domain:

1. Visualisation: the ability of a participant to enhance one or more traces (a fingermark or a residual trace) through the use of a specific technique or sequencing of multiple methods.

Issues

- fingermarks composition (natural, or by given standards):

a) How to choose donors when natural fingerprints are in use? How to guarantee the same test conditions in different laboratories?
b) At present, do standards around sweat deposition really exist? Are they representative of true working conditions [6,7]?

- the item: it is clear that preference should be given to objects that are easily transportable as this represents a limitation in test distribution;
- transport conditions: is there a need to monitor logistics, as factors such as humidity could affect the end results;
- result evaluation on the basis of presence/absence of the fingermark(s) or referencing the quality of fingermark(s) observed (e.g. based on existent standard scales) [6].

2. Imaging: the ability of the participant to capture and process images relating to fingerprints.