STRATEGIC BUSINESS PLAN

ISO/TC 272
Forensic Sciences

EXECUTIVE SUMMARY

ISO/TC 272 has been established to develop standards that relate to the delivery of forensic science services. Such standards primarily apply to organizations involved in the analysis and/or interpretation of physical evidence for the purposes of presenting conclusions to a court of law. The standards are designed to preserve the features of evidence that are subject to observation and to maintain the integrity of evidence through each stage of testing. They are also designed to facilitate information sharing between international jursidictions.

The quality and nature of the materials, reagents and consumables used by forensic service providers during testing can negatively impact on the features of the physical evidence under examination. The committee also develops standards directed towards manufacturers that are designed to control the production of such materials to ensure they are fit for forensic purposes. The committee recently produced ISO/FDIS 18385, *Minimizing the risk of human DNA contamination in products used to collect and analyze biological material for forensic purposes*. This standard will ensure that crimes are not mistakenly linked as a result of the DNA contamination of forensic consumables.

In 2009 the National Academy of Science (NAS) within the United States published a report highlighting the lack of forensic standards and the potential impact that this was having on the administration of justice. These criticisms are applicable world-wide. A number of countries are now in the process of developing national forensic standards. Standards Australia has published AS5388 Forensic Analysis. CEN is currently developing a draft standard for the collection of forensic evidence. There are also a number of ASTM standards in existence. The continued uncoordinated development of national standards may limit the exchange of forensic evidence and intelligence across international borders which has the potential to impact on the investigation of global crime including terrorism, fraud and child exploitation. This is also creating duplication of effort by ISO member bodies.

The objectives of the TC are to develop standards that:

- Enhance the reliability of forensic evidence.
- Establish consistent work practices that facilitate forensic laboratories/agencies from different jurisdictions to work collaboratively in response to cross border investigations.
- Enable agencies from different jurisdictions to support one another in the event of a catastrophic event that exhausts a jurisdiction's capabilities.
- Allow for the exchange of forensic results, information and intelligence including the sharing of databases.
- Ensure forensic supplies are fit for purpose and do not impact upon the features under examination.
- Allow mobility of forensic professionals.

Standards developed under TC272 are not designed to replace ISO17025 and ISO17020 and can be used complementary to them or stand alone.

1. INTRODUCTION

1.1 ISO technical committees and business planning

The extension of formal business planning to ISO Technical Committees (ISO/TCs) is an important measure which forms part of a major review of business. The aim is to align the ISO work programme with expressed business environment needs and trends and to allow ISO/TCs to prioritize among different projects, to identify the benefits expected from the availability of International Standards, and to ensure adequate resources for projects throughout their development.

1.2 International standardization and the role of ISO

The foremost aim of international standardization is to facilitate the exchange of goods and services through the elimination of technical barriers to trade.

Three bodies are responsible for the planning, development and adoption of International Standards: ISO (International Organization for Standardization) is responsible for all sectors excluding Electrotechnical, which is the responsibility of IEC (International Electrotechnical Committee), and most of the Telecommunications Technologies, which are largely the responsibility of ITU (International Telecommunication Union).

ISO is a legal association, the members of which are the National Standards Bodies (NSBs) of some 164 countries (organizations representing social and economic interests at the international level), supported by a Central Secretariat based in Geneva, Switzerland.

The principal deliverable of ISO is the International Standard.

An International Standard embodies the essential principles of global openness and transparency, consensus and technical coherence. These are safeguarded through its development in an ISO Technical Committee (ISO/TC), representative of all interested parties, supported by a public comment phase (the ISO Technical Enquiry). ISO and its Technical Committees are also able to offer the ISO Technical Specification (ISO/TS), the ISO Public Available Specification (ISO/PAS) and the ISO Technical Report (ISO/TR) as solutions to market needs. These ISO products represent lower levels of consensus and have therefore not the same status as an International Standard.

ISO offers also the International Workshop Agreement (IWA) as a deliverable which aims to bridge the gap between the activities of consortia and the formal process of standardization represented by ISO and its national members. An important distinction is that the IWA is developed by ISO workshops and fora, comprising only participants with direct interest, and so it is not accorded the status of an International Standard.

2. BUSINESS ENVIRONMENT OF THE ISO/TC

2.1 Description of the Business Environment

The following political, economic, technical, regulatory, legal and social dynamics describe the business environment of the industry sector, products, materials, disciplines or practices related to the scope of this ISO/TC, and they may significantly influence how the relevant standards development processes are conducted and the content of the resulting standards:

The term 'forensic science' relates to all examination and analytical testing where the result or conclusion is presented as evidence before a court of law. This includes various types of qualitative, quantitative or empirical testing designed to identify a material, establish a link between items or reconstruct events.

Terrorism, fraud and child exploitation crimes continue to cross international borders. Standardization in the manner that forensic evidence is collected, classified and stored is critical to enable sharing of information and intelligence between jurisdictions to successfully prosecute such perpetrators.

Forensic science has come under significant criticism over the last decade. In 2009 the National Academy of Science (NAS) within the United States published a report highlighting the lack of appropriate standards within the industry and the negative impact that this was having on the administration of justice. Although the report was US based, the criticisms were applicable world-wide. Since this publication there has been improvement in the quality of forensic service provision due to a wider uptake of laboratory accreditation against the ISO17025 and ISO17020 standards. Such standards however are of a generic nature and do not address many of the critical risks unique to forensic science and they do not facilitate data/information sharing. Standards developed under TC272 are not designed to replace ISO17025 and ISO17020 and can be used complementary to them or stand alone.

There have been moves at a national level to develop forensic standards. Standards Australia has published AS5388 Forensic Analysis. The European Committee for Standardization (CEN) is currently developing a draft standard for the collection of forensic evidence. The American Society for Testing and Materials (ASTM) has developed a series of guides for specific areas of forensic testing. However, standards relating to the delivery of forensic science at an international level do not exist. As a result there remains a risk that national divergence may limit the exchange of forensic products and services including forensic intelligence across international borders. The lack of standards may also result in evidence being ruled inadmissible in some jurisdictions. This situation is also resulting in the unnecessary duplication of effort by member organizations of ISO. The establishment of ISO/TC 272 serves to promote international standardization and information sharing.

The key stakeholders impacted by the development of forensic standards include: forensic service providers, law enforcement agencies, courts of law, and suppliers of forensic equipment/consumables.

Forensic service providers deliver a vast array of different products ranging from testing that is primarily instrumental based to testing that is based purely on human cognition Forensic practitioners are in the unique position of being allowed to present opinion evidence to courts, provided they have expertise within the area under examination. Much of the opinion evidence provided can be considered subjective in nature which lends itself to an increased or unknown risk of error, particularly when there are no recognized standards. The lack of internationally recognized standards has fueled frequent challenges of evidence resulting in reliable evidence being ruled inadmissible.

The delivery of forensic science is subject to laws and regulations that vary from country to country. Such legislative variations usually pertain to:

- Who is authorized to provide particular forensic services.
- Limitations on the type of testing that may be undertaken.
- How information on forensic databases must be secured.
- Rules relating to the delivery of expert evidence.

Generally, the manner in which forensic testing is performed is not covered by legislation. The development of international standards would fill this gap.

There is widespread support within the international forensic community, legal fraternity and justice systems for the development of forensic standards.

2.2 Quantitative Indicators of the Business Environment

The following list of quantitative indicators describes the business environment in order to provide adequate information to support actions of the ISO/TC:

There are of six separate regional associations devoted to benchmarking standards within the international forensic science community:

- The European Network of Forensic Science Institutes (ENFSI) which has 64 member laboratories.
- The American Society of Crime Laboratory Directors (ASCLD) which has 396 laboratories accredited under its scheme.
- The Asian Forensic Science Network (AFSN) which has 36 member laboratories.
- The Senior Managers Australian and New Zealand Forensic Laboratories (SMANZFL) with 14 member laboratories.
- The Academia Iberoamericanade Criminalistica Y Estudios Forenses (AICEF) which has 27 member laboratories.
- The South African Regional Forensic Science Network (SARFS) which has 12 member laboratories.

The overwhelming majority of the members are state based forensic laboratories. Together these associations form the International Forensic Science Alliance (IFSA) whose vision is '*To create opportunities for strategic collaboration across the global forensic science community*'. IFSA advocates for the accreditation of all its member laboratories against ISO17025 or ISO17020. It is anticipated that the combined IFSA membership of over 500 laboratories would have great interest in the development and implementation of forensic science standards.

There are also a considerable number of private and state based laboratories that are not IFSA members that would have a similar interest in the use and development of standards.

The number of forensic science providers in developing countries is growing at a rapid pace. Generally these providers are not accredited and the range of services provided is limited. These providers would benefit greatly as a result of the guidance that ISO forensic standards would provide resulting in increased reliability of results. It is anticipated in the first instance that such providers would self assess against forensic standards due to the prohibitive costs of accreditation.

The manufacturing industry has indicated a high level of interest in the development of standards pertaining to the manufacture of supplies that are specific for forensic use. Previously forensic laboratories were forced to utilise materials that were manufactured for medical purposes. These items are sterile, but they may not be DNA free. The establishment of standards for forensic grade supplies creates a niche market that has a large potential customer base.

3. BENEFITS EXPECTED FROM THE WORK OF THE ISO/TC

There is currently a lack of agreed formal international standards for the conduct of forensic analysis. Internationally incidents continue to happen where miscarriages of justice have occurred due to faulty forensic evidence highlighting the negative impact that the lack of agreed standards in forensic science can have.

Compliance to a platform of relevant standards for law enforcement and forensic disciplines would ensure that methodologies are robust, repeatable and validated, and that training across jurisdictions is consistent. This would have a direct bearing on the quality of scientific evidence presented in the courts, and would increase the likelihood of successful justice outcomes.

Consistent and accepted standards within the forensic community will benefit all users of the judicial system including members of the public as well as legal and forensic practitioners. The establishment of Standard procedures would reduce the risk of miscarriages of justice, therefore there is the potential for significant savings to the community with respect to the costs of re-trials or other litigious processes. Recent issues in various countries illustrate the benefits that standards could provide, particulalrly in the pattern matching sciences such as hair analysis, DNA interpretation, fingerprints etc.

As more forensic information is being collected on international databases (fingerprint, DNA and other biometric database), the importance of standardised protocols for collection, storage, analysis and interpretation is of critical importance to ensure that the data collected is reliable and interpretations are based on comparable technologies and techniques. This will also apply to emerging technologies such as facial identification.

Recognised standards facilitate professional mobility. This is a direct consequence of standards and standardisation. Professional mobility has many advantages in times when a rapid response is required to scenes of major crime or disaster which are beyond the means and capabilities of any one jurisdiction (eg multi-jurisdictional responses to MH17 crash site). The ability to mobilise a multi-jurisdictional forensic response with consistent training and knowledge to major incidents provides for better outcomes in less time with less cost (due to the concomitant reduction in resource intensive training and revision of variations in protocols). This enhances national and international capacity and capability and enhances growth of both the individuals and forensic disciplines.

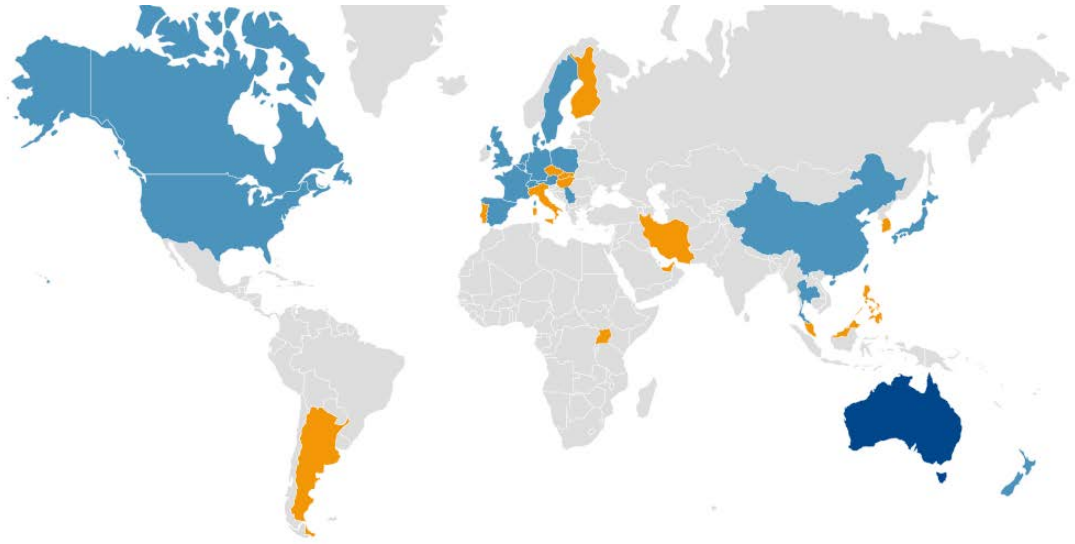
The existence of a forensic standard would benefit smaller forensic service providers and individual practitioners that are currently providing niche forensic services to the public and the judicial system. Currently, smaller non-government service providers are unable to meet the cost of external accreditation (both the cost of compliance and assessment) and are looking for guidance in developing procedures and protocols that would ensure legal acceptability and consumer confidence, within the constraints of their environment. Without any standard practice to follow, there is a significant risk that such evidence may be tainted and therefore be rendered inadmissible in a court of law.

Additionally, the existence of national Standards would reduce the duplication that currently occurs between forensic laboratories in establishing concurrent methodologies within their own jurisdictions.

4. REPRESENTATION AND PARTICIPATION IN THE ISO/TC

4.1 Membership

There are 20 participating and 13 observing countries on TC 272. Australia holds the secretariat and chair. Membership is illustrated and listed below. Further details can also be found at the folloing link: http://www.iso.org/iso/home/standards_development/list_of_iso_technical_committees/iso_technical_committee_participation.htm?commid=4395817



Secretariat

Australia (SA)

Participating Countries (20)

- Australia (SA)
- Austria (ASI)
- Belgium (NBN)
- Canada (SCC)
- China (SAC)
- Denmark (DS)
- France (AFNOR)
- Germany (DIN)
- Japan (JISC)
- Netherlands (NEN)
- New Zealand (SNZ)
- Poland (PKN)
- Serbia (ISS)
- Singapore (SPRING SG)
- Spain (AENOR)
- Sweden (SIS)
- Switzerland (SNV)
- Thailand (TISI)
- United Kingdom (BSI)
- United States (ANSI)

Observing Countries (13)

- Argentina (IRAM)
- Czech Republic (UNMZ)
- Finland (SFS)
- Hungary (MSZT)
- Iran, Islamic Republic of (ISIRI)
- Italy (UNI)
- Korea, Republic of (KATS)
- Malaysia (DSM)
- Philippines (BPS)
- Portugal (IPQ)
- Slovakia (SOSMT)
- Uganda (UNBS)
- United Arab Emirates (ESMA)

4.2 Analysis of the participation

TC272 has met on four occasions to progress the ISO/FDIS 18385, Minimizing the risk of human DNA contamination in products used to collect and analyze biological material for forensic purposes. On each occasion members from the following countries were present and actively involved:

- United States of America
- United Kingdom
- Japan
- Australia
- Thailand
- Germany
- France
- Switzerland
- Sweden
- Netherlands

The primary members of the committee are experts within the forensic community. Given the first project was a manufacturing standard, the United States, Germany and Switzerland provided additional representatives from the forensic consumable manufacturing industry.

There has been considerable interest in the ISO FDIS 18285 from forensic practitioners and manufacturers. Upon releases of the DIS for comment, over 200 replies were received. The comments tended to be very constructive resulting in a highly developed and inclusive FDIS.

SMANZFL, ASCLD, ENSFI and AFSN strongly support the development of forensic standards. These regional network associations were established to benchmark standards and they collectively represent nearly all of the accredited forensic laboratories in the world. The TC representatives of each of the relevant nations have been endorsed by these organisations.

Generally the forensic laboratories within developing countries are unaccredited due to the high costs involved. As a result they currently have lower interest in the development of the ISO standards. These countries are also generally not involved in the manufacture of forensic specific supplies which attributes to their lack of involvement in the first standard which is manufacturing focused. It is anticipated that the level of interest amongst developing countries will increase considerably upon the release of standards that directly relate to the provision of forensic services due to the guidance they will provide. They will provide the opportunity for such laboratories to self-certify enhancing the quality and reliability of their service.

5. OBJECTIVES OF THE ISO/TC AND STRATEGIES FOR THEIR ACHIEVEMENT

5.1 Defined objectives of the ISO/TC

The objectives of the TC are to develop standards that:

- Enhance the reliability of forensic evidence.
- Establish consistent work practices that facilitate forensic laboratories/agencies from different jurisdictions to work collaboratively in response to cross border investigations.
- Enable agencies from different jurisdictions to support one another in the event of a catastrophic event that exhausts a jurisdiction's capabilities.
- Allow for the exchange of forensic results, information and intelligence including the sharing of databases.
- Ensure forensic supplies are fit for purpose and do not impact upon the features under examination.
- Allow mobility of forensic professionals.

Forensic science includes a wide range of distinct disciplines that undertake a mixture of qualitative, quantitative and comparative testing.

Forensic disciplines include, but are not limited to:

- Toxicology
- Document Examination
- Drug Analysis
- Blood Alcohol Analysis
- Chemical Trace Evidence
- Clandestine Laboratory Investigations
- Fire and Explosion Investigation
- Ballistics
- Forensic Biology
- DNA Science
  - Entomology, acheology, anthropology, botany
  - Fingerprints
  - Marks and impressions
  - Crime scene

Some simply report the results of empirical testing whilst others make an assessment of the data observed based on experience or statistical analysis. When viewed from a process point of view, forensic analysis generally consists of up to four stages including:

1. Detection and collection of material (sampling).
2. Examination and analysis of material.
3. Possible interpretation of the results of examination and analysis.
4. Reporting of the results and conclusions.

Within each of these stages there are generic requirement that must be satisfied in order to preserve the integrity of the evidence. It is possible to develop general requirements for each stage that are relevant to all or most disciplines. The development of such generic standards would prevent duplication of effort should discipline specific standards be later progressed. Standards can be created that follow the forensic process. A crime scene and evidence preservation standard is the first standard being developed.

5.2 Identified strategies to achieve the ISO/TC's defined objectives

Upon completion of ISO/FDIS 18385 the TC intends to expand its manufacturing focus to include standards that pertain to supplies used in other areas of trace evidence analysis. For instance, supplies utilized in the analysis of gunshot residues and toxicology have the potential to contain contaminants that inhibit analysis or cause false results. PAS377 can be used as a working draft to develop further manufacturing standards.

The TC also intends to commence work on standards that focus on forensic analytical processes. Although forensic science consists of a vast rage of disciplines, from a process point of view they all follow a similar workflow involving:

1. Recording.
2. Sampling.
3. Presumptive testing and assessment.
4. Instrumental analysis.
5. Comparisons.
6. Recording results.

The TC intends to create a set of core standards that detail critical requirements common to all disciplines. Given the impact of recording/sampling on downstream analysis, it would be most appropriate to commence a 'collection' standard around this as the next body of work. It is anticipated that it would take two years for the completion of this standard.

The following four Australian Standards have already been published:
AS5388.1 Forensic Analysis. Part 1: Recognition, recording, recovery, transport and storage of material
AS5388.2 Forensic Analysis. Part 2: Analysis and examination of material.
AS5388.3 Forensic Analysis. Part 3. Interpretation
AS5388.4 Forensic Analysis. Part 4. Recording.

CEN was working on a collection standard which is at initial draft stage. The content of this document was combined with a reduced version of AS5388.1 to establish an initial draft of a collection standard.

The remaining 3 Australian standards could be used as initial drafts for the other core standards Use of these documents will significantly reduce the time and effort to reach the DIS stage for each standard.. These standards have some level of overlap. It may be possible for multiple working groups to be established under the TC to work concurrently on these standards. This should enable the all of the coer process standards to be completed within 6 years.

It is anticipated that the standards will generate a great amount of international interest. As a result face to face meetings will be required to consider comments and ensure inclusivity of all stakeholders.

Upon completion of the core standards there remains the possibility to develop discipline specific forensic standards.

In order to progress these bodies of work the TC will initially form 3 working groups as follows:
(i) Vocabulary working group
(ii) Processes working group
(iii) Products working group

Each working group will be made up appropriate experts. It is anticipated that working drafts of documents can be developed out of session through teleconference and other modes of electronic communication. The draft standards will generate a great amount of international interest. As a result face to face meetings will be required to consider comments and ensure inclusivity of all stakeholders.

6. FACTORS AFFECTING COMPLETION AND IMPLEMENTATION OF THE ISO/TC WORK PROGRAMME

Dr Linzi Wilson-Wilde from Australia currently holds the position of chair of TC272. Standards Australia are providing secretariat services.

At this point the positions on each of the working groups including convenors are vacant. Given the support of ASCLD, ENFSI AFSN and SMANZFL there should be no issues regarding the availability of experts to fill working group positions.

Standards Australia have indicated a wiliness for their AS5388 standards to be used to develop initial drafts.

7. STRUCTURE, CURRENT PROJECTS AND PUBLICATIONS OF THE ISO/TC

Information on ISO online

The link below is to the TC's page on ISO's website:
http://www.iso.org/iso/home/standards_development/list_of_iso_technical_committees/iso_technical_committee.htm?commid=4395817

Click on the tabs and links on this page to find the following information:

- About (Secretariat, Secretary, Chair, Date of creation, Scope, etc.)
- Contact details
- Structure (Subcommittees and working groups)
- Liaisons
- Meetings
- Tools

The current work programme (published standards and standards under development) for TC272 is available at:
http://www.iso.org/iso/home/store/catalogue_tc/catalogue_tc_browse.htm?commid=4395817&development=on

Reference information

Glossary of terms and abbreviations used in ISO/TC Business Plans

General information on the principles of ISO's technical work