



# NATIONAL COMMISSION ON FORENSIC SCIENCE

**NIST**  
National Institute of  
Standards and Technology  
U.S. Department of Commerce

## Recommendation to the Attorney General Technical Merit Evaluation of Forensic Science Methods and Practices

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<b>Subcommittee</b>
Scientific Inquiry and Research
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### Overview

The Commission has developed a views document on the importance of technical merit to establish the methodological limits for forensic sciences and the need for technical merit studies to be performed, independently<sup>1</sup> evaluated, and documented prior to the creation of documentary standards<sup>2</sup> involving test methods<sup>3</sup> and practices<sup>4</sup> based on these disciplines.

As the Commission charter provides for the Attorney General to refer to the Director of the National Institute of Standards and Technology (NIST) matters related to priorities for standards development,<sup>5</sup> the following recommendations are requested to be referred to NIST.

### Recommendations

The National Commission on Forensic Science recommends that the Attorney General refer to the Director of NIST the following recommendations regarding priorities for standards development:

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<sup>1</sup> For the purposes of this document, “independent” refers to a body that is fair, impartial, and without conflict of interest in the results of the evaluation. An entity’s independence does not imply that this work will be conducted without the contribution of individuals who are knowledgeable of a specific discipline. It is expected that an independent scientific body will be able to retain the relevant experts to advise the independent body as to the real life forensic application of the science.

<sup>2</sup> “For simplicity, this report focuses on documentary standards, which are written agreements containing technical specifications or other precise criteria that may contain rules, guidelines, or definitions of characteristics.” Brietenberg, M.A. (August 2009). *The ABC’s of Standards Activities* (NISTIR 7614), p. 5. Retrieved from NIST, available at [http://gsi.nist.gov/global/docs/pubs/NISTIR\\_7614.pdf](http://gsi.nist.gov/global/docs/pubs/NISTIR_7614.pdf) (last accessed, May 30, 2016).

<sup>3</sup> A “test method” is defined as “a definitive procedure that produces a test result.” ASTM.org, “ASTM International/Definitions and Sample Standards,” p. 1. Available at [http://www.astm.org/toolkit/images/ASTM%20Information/Sample\\_Standards\\_English/Sample\\_Standards\\_with\\_Cover\\_Sheet.pdf](http://www.astm.org/toolkit/images/ASTM%20Information/Sample_Standards_English/Sample_Standards_with_Cover_Sheet.pdf) (last accessed, May 25, 2016). (Hereafter, ASTM Definitions).

<sup>4</sup> A “practice is defined as “a definitive set of instructions for performing one or more specific operations that does not produce a test result.” ASTM Definitions, p. 1.

<sup>5</sup> Justice.gov, “Charter U.S. Department of Justice National Commission on Forensic Science,” section 5, available at <http://www.justice.gov/ncfs/file/624216/download> (last accessed, 01/22/2016).

**Recommendation #1: NIST should establish an in-house entity with the capacity to conduct independent scientific evaluations of the technical merit of the forensic sciences upon which test methods and practices are based.**

The Commission recognizes that NIST is a non-regulatory agency and is thus not recommending that NIST's function here will be regulatory in nature. The Commission recommends that NIST establish an infrastructure designed to conduct independent scientific evaluations of the requisite data and research pertaining to technical merit<sup>6</sup> of forensic science disciplines. The 2009 NAS report, "Strengthening Forensic Science in the United States: A Path Forward," (hereafter, "NAS report") found "substantial evidence indicating that the level of scientific development and evaluation varies substantially among the forensic science disciplines" and "[a]body of research is required to establish the limits and measures of performance and to address the impact of sources of variability and potential bias."<sup>7</sup> Currently, no independent national scientific entity or organization has been charged with the independent evaluation of technical merit studies for forensic science test methods. In order to ensure that the evaluations of the science underlying forensic science test methods and practices are rigorous, reliable, uniform, consistent, fair, and impartial, it is critical that a single independent scientific agency be responsible for this work. NIST is an independent science agency and has the intellectual resources to assemble the necessary knowledge base.

**Recommendation #2: The results of the evaluations will be issued by NIST as publicly available resource documents. NIST's evaluation may include, but is not necessarily limited to: research performed by other agencies and laboratories; research and analyses developed at the Center for Statistics and Applications in Forensic Evidence (CSAFE); its own intramural research program; or research studies documented in the scientific literature.<sup>8</sup> NIST should initially begin its work by piloting three resource documents to establish their design and requirements. The release of these documents should be broadly disseminated in the scientific and criminal justice communities and accompanied by judicial trainings.**

The Commission believes that evaluations by NIST, supported by this pedigree, can bridge the gap between technical merit and criminal justice. In recommending that NIST assume the role of independent scientific evaluator within the criminal justice system for technical merit forensic science disciplines, the Commission encourages universities, scientific agencies, and other research entities, such as Statistical and Applied Mathematical Sciences Institute (SAMSI), to conduct research investigating the technical merit of forensic science disciplines. While NIST may have a centralized evaluative role, the Commission envisions that the data and research NIST will evaluate will be generated by the robust and diverse scientific research community as well as by NIST. The resulting resource documents will be continually updated as the state of the science develops.

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<sup>6</sup> For the purposes of this document, technical merit is defined as "studies and data that establish the basis for a particular claim in terms of a technique's accuracy, capabilities, and limitations." The data and research that need to be gathered to support technical merit include, but are not limited to, clearly defined terminology, quality control, uncertainty, limitations, validation, fitness-for-purpose, and general acceptance in both the forensic and the general scientific communities, as described in the "OSAC Technical Merit Worksheet," available at <https://workspace.forensicosac.org/kws/public/download.php/4551/4%20-%20OSAC%20QIC%20Form-01%20Technical%20Merit%20Worksheet%20Form%20V4.pdf> (last accessed May 31, 2016).

<sup>7</sup> National Research Council. Strengthening Forensic Science in the United States: A Path Forward. Washington, DC: The National Academies Press, 2009. doi:10.17226/12589, p. 7-8.

<sup>8</sup> As defined by the National Commission on Forensic Science views document "Scientific Literature in Support of Forensic Science and Practice" available at <http://www.justice.gov/ncfs/file/786591/download> (last accessed, 01/22/2016).

Centralizing the evaluative role will facilitate the development of a knowledge base at NIST that will build over time.

**Recommendation #3: The Organization of Scientific Area Committees for Forensic Science (OSAC) leadership, the Forensic Science Standards Board (FSSB), should commit to placing consensus documentary standards on the OSAC Registry of Approved Standards for only those forensic science test methods and practices where technical merit has been established by NIST, or in the interim, by an independent scientific body.**

Central to this document is the principle that the underlying science used in adjudications in our criminal justice system be subject to independent scientific evaluation before it is used in a judicial proceeding. It is the recommendation and hope of the Commission that NIST will ultimately develop resource documents for all forensic science disciplines, but that process will take time. In the interim, proponents of a forensic science test method or practice can seek technical merit evaluation from another independent scientific body.

These recommendations are in line with the OSAC Registry of Approved Standards statement that “the methods it contains have been assessed to be valid” and are consistent with NIST’s mission,<sup>9</sup> its statutory function,<sup>10</sup> and its delegated responsibilities in the Memorandum of Understanding.<sup>11</sup>

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<sup>9</sup> NIST.gov, “OSAC Registry of Approved Standards and OSAC Registry of Approved Guidelines,” available at <http://www.nist.gov/forensics/osac/osac-registries.cfm> (last accessed, May 25, 2016).

<sup>10</sup> 15 U.S. Code Chapter 7 – National Institute of Standards and Technology, § 272 (b).

<sup>11</sup> Memorandum of Understanding between the Department of Justice and the National Institute of Standards and Technology in Support of the National Commission on Forensic Science and the Organization of Scientific Area Committees, August 5, 2015, available at <http://www.justice.gov/ncfs/file/761051/download> (last accessed, January 15, 2016). VI. Agency Responsibilities, B. National Institute of Standards and Technology.

## **Appendix A**

Refer to the Views work product on Validation of Forensic Science Methodology developed by the Scientific Inquiry and Research Subcommittee.