

## Comments of the Human Factors Task Group on ANSI/ASB 053, “Standard for Report Content in Forensic Toxicology”

***The OSAC Human Factors Task Group has unanimously approved these comments.***

This standard is promising and important, but it is not yet fully consistent with best practices for reporting of forensic science findings. Improvements are needed before it is placed on the OSAC Registry.

The current version can and should be enhanced by requiring a full and fair acknowledgement of scientific uncertainty. Although in the past it was common for forensic scientists to report findings without discussing possible sources of variability and error, this is no longer considered “best practice,” and reports that fail to acknowledge uncertainty are likely to be vulnerable to objections when offered in courts of law. From a human factors perspective, communicating the sources and degree of uncertainty in any scientific result is especially critical in assisting finders of fact to understand how to integrate the results into an overall decision.

The 2009 report of the National Research Council on Strengthening Forensic Science in the United States, a document that has been referenced in a number of cases, declared that forensic science reports must describe, at a minimum, “the sources of uncertainty in the procedures and conclusions along with estimates of their scale (to indicate the level of confidence in the results).” (p. 186). According to the NRC Report, “Forensic science reports, and any courtroom testimony stemming from them, must include clear characterizations of the limitations of the analyses, including associated probabilities where possible.” (p. 186).

Similarly, the National Commission on Forensic Science declared that: “Reports should clearly state ... the estimated uncertainty and variability; and possible sources of error and limitations in the method, data, and conclusions.” (Recommendations to the Attorney General: Documentation, Case Record, and Report Contents, September 13, 2016).

These recommendations have been incorporated into OSAC’s Instructions for Scientific and Technical Review Panels (STRPs). The instructions call for STRPs to verify that a proposed standard “provides for estimates and expressions of the uncertainties in all qualitative and quantitative measurements” and states that the “potential magnitude of errors in any measurement must be assessed and reported so that the measurement can be used for informed decision making.” For binary decisions or other classifications, such as reporting that an analyte was “identified” or “detected,” the STRP should verify that “it includes guidance on expressing the accuracy of the decision or classification method (or, conversely, the risk of a wrong decision or classification).” The FSSB approved the instructions for STRPs in part to assure that OSAC standards live up to contemporary norms of scientific accuracy and transparency.

The standard under consideration here, ANSI/ASB 053 (1<sup>st</sup> Ed. 2019), was developed before implementation of the new procedures of OSAC 2.0 and therefore has not had the benefit of STRP review. If such a review were conducted, it is likely that the STRP would conclude that this standard fails to meet the requirements for scientific rigor and transparency in reporting that the STRPs are tasked to

enforce. It would allow qualitative “positive results” to be reported without any expression or discussion of uncertainty, and would require reporting of “an estimated uncertainty of measurement” for quantitative results only when “accreditation, regulation, or internal laboratory procedures require an estimated uncertainty of measurement to be calculated.” (Section 5.5). In addition, it would permit analytic results to be reported using qualitative descriptors without requiring the disclosure of any available data on the uncertainty associated with scoring qualitative assays, or their accuracy. This is particularly troublesome from a human factors point of view because of the degree to which qualitative measures, which often rely in part of subjective judgment, are open to different, unanchored interpretations.

The question facing the FSSB is whether such a standard deserves to be on the OSAC Registry when it fails to meet the requirements for scientific rigor and transparency that STRPs are now expected to apply. Placing this standard on the OSAC Registry would suggest that the FSSB does not take these requirements seriously, or views them as merely precatory. It may be seen as setting a precedent under which other standards that have these same scientific shortcomings should be tolerated.

Correcting these shortcomings and developing toxicology standards that incorporate current best scientific practices can be accomplished with very little additional effort. Forensic toxicologists are already required to estimate uncertainty for common procedures. Indeed, the OSAC Registry includes a document, “Standard Practices for Method Validation in Forensic Toxicology” that provides a cogent discussion of how to estimate measurement error in many circumstances. Following this guidance, labs should already have the data needed to describe the uncertainty in their testing results. All that is left to do is to add to the proposed standard language on how to communicate findings regarding uncertainty in a concise manner that can be understood by the intended audience.

The Human Factors Task Group includes a number of scholars with expertise in communicating scientific information to lay audiences, and we hereby volunteer to collaborate with the Forensic Toxicology Subcommittee to develop reporting standards that acknowledge uncertainty and discuss it in a scientifically sound and comprehensible manner. We applaud the effort and progress the Toxicology Subcommittee has made in developing this standard, and appreciate its willingness to consider this proposed enhancement to its important work.