OSAC RESEARCH NEEDS ASSESSMENT FORM

Title of research need: Evaluation of examiner conclusions utilizing a five-point scale

Keyword(s): source conclusions; inconclusive; error rate; AFTE Range of Conclusions, firearms and toolmarks

Submitting subcommittee(s): Firearms and Toolmarks   **Date Approved:**

(If SAC review identifies additional subcommittees, add them to the box above.)

Background Information:

1. Description of research need:

The AFTE Range of Conclusions defines five source conclusions which includes three descriptions of inconclusive; however, it is unclear how examiners practically apply the scale of inconclusive when comparing evidence. Past research has primarily focused on false positive and false negative error rates to determine the accuracy of examiners' source conclusions. Research with an emphasis on all source conclusions, especially the range of inconclusive options, would assist in developing a better understanding of how examiners currently utilize and interpret the AFTE Range of Conclusions.

2. Key bibliographic references relating to this research need:

Bruce Moran, A Report on the AFTE Theory of Identification and Range of Conclusions for Tool Mark Identification and Resulting Approaches to Casework, AFTE Journal, Vol. 34, No. 2, 2002.

David Baldwin, Stanley Bajic, Max Morris and Daniel Zamzow, A Study of False-Positive and False-Negative Error Rates in Cartridge Case Comparisons, Ames Laboratory USDOE Technical Report # IS-5207, April 2014.

Theory of Identification as it Relates to Toolmarks (including Range of Conclusions), AFTE Journal, Vol. 30, No 1, 1998.

3a. In what ways would the research results improve current laboratory capabilities?

It is anticipated that this research would allow for universal application in laboratory procedures when reporting conclusions of comparative examinations.

3b. In what ways would the research results improve understanding of the scientific basis for the subcommittee(s)?

Current laboratory practice varies in how inconclusive comparisons are reported. The AFTE Range of Conclusions classifies inconclusive as (A) some individual characteristics but insufficient for identification;

(B) insufficient agreement or disagreement of individual characteristics to make any determination; (C) some disagreement of individual characteristics, but insufficient for an elimination. It's anticipated this research would provide insight into examiner decision making as it specifically applies to the inconclusive observations during a comparison. The Firearms and Toolmark subcommittee is drafting standards on firearm and toolmarks source conclusions and considering options (i.e. five-point scale vs. three point scale; inconclusive ranges, etc). This research would help guide the subcommittee with our standard development.

This research could also help identify training that might be required to the firearms community as to the scale reporting or non-scale reporting of inconclusive comparisons.

3c. In what ways would the research results improve services to the criminal justice system?

The criminal justice system would benefit from a better understanding and a more universally applied standard of examiner conclusions and the articulation of those conclusions which would assist the trier of fact.

4. Status assessment (I, II, III, or IV):   II

		Major gap in current knowledge	Minor gap in current knowledge
No or limited current research is being conducted		I	III
Existing current research is being conducted		II	IV

This research need has been identified by one or more subcommittees of OSAC and is being provided as an informational resource to the community.

Approvals:

Subcommittee	Approval date: 5/4/2018

(Approval is by majority vote of subcommittee. Once approved, forward to SAC.)

SAC

1. Does the SAC agree with the research need?   Yes   x   No   ☐

2. Does the SAC agree with the status assessment?   Yes   x   No   ☐

       If no, what is the status assessment of the SAC: ☐

Approval date: 5/4/2018

(Approval is by majority vote of SAC. Once approved, forward to NIST for posting.)