OSAC RESEARCH NEEDS ASSESSMENT FORM

Title of research need: Validation of Origin and Cause Determination Protocols

Describe the need: Reliability and validity studies need to be conducted on current methodologies used to determine origin and cause. New methodologies could also be proposed and tested. Existing guidance in NFPA 921 does not fully address uncertainty, reliability, and limitations associated with current methodologies used to determine origin and cause. There is a need for comprehensive statistically sound assessments of current methodologies.

Keyword(s): Validity, reliability, origin, cause

Submitting subcommittee(s): Fire & Explosion Investigation Date Approved: March 10, 2021

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

Background Information:

1. Does this research need address a gap(s) in a current or planned standard? (ex.: Field identification system for on scene opioid detection and confirmation)
   
   Yes. NFPA 921 speaks to a number of techniques but does not completely address uncertainty and limitations.

2. Are you aware of any ongoing research that may address this research need that has not yet been published (e.g., research presented in conference proceedings, studies that you or a colleague have participated in but have yet to be published)?

   No.


   Cox, A (2013). Origin Matrix Analysis: A systematic methodology for the assessment and interpretation of compartment fire damage. Fire and Arson Investigator, 64(1) 37--47.
4. Review the annual operational/research needs published by the National Institute of Justice (NIJ) at https://nij.ojp.gov/topics/articles/forensic-science-research-and-development-technology-working-group-operational#latest? Is your research need identified by NIJ?

No.

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

The research would quantify uncertainty, repeatability, and limitations associated with current methodologies used to determine origin and cause. The research could lead to more consistent and accurate methodologies.

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

See Number 5.

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

More reliable and accurate methodologies will enhance the basis of conclusion make regarding origin and cause.

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

Major gap in current knowledge

Minor gap in current knowledge

No or limited current research is being conducted

Existing current research is being conducted

I

III

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.