OSAC RESEARCH NEEDS ASSESSMENT FORM

Title of research need: Room Size Impacts on Fire Patterns

Keyword(s): Room size, fire size, ventilation patterns, fire patterns, fire pattern creation, fire origin

Submitting subcommittee(s): Fire and Explosion **Date Approved:**

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

Background Information:

1. Description of research need:

In the last forty years or so, the trend in single family home construction has been to move away from small rooms low in height to larger open areas with high ceilings. A home today may have the living area on the ground floor constructed as one large open area without walls separating functional spaces. Sleeping areas may be large suites rather than individual bedrooms and bathrooms. Most of the research on patterns has been conducted in "typical" size rooms; for example, ten feet by twelve feet by eight feet in height. Research is needed in larger spaces with the modern furnishings to identify this impact on patterns.

2. Key bibliographic references relating to this research need:

Gorbett, G., Meacham, B., Wood, C., and Dembsey, N. *Use of Damage in Fire Investigation: A review of fire patterns analysis, research and future direction.* Fire Science Reviews, **4**:4, doi 10.1186/s40038-015-0008-4

Kerber, S. (2010) Impact of Ventilation on Fire Behavior in Legacy and Contemporary Residential Construction. Underwriters Laboratories, Illinois.

Mealy, C., Wolfe, A., Gottuk, D. (2013). Forensic Analysis of Ignitable Liquid Fuel Fires in Buildings. NIJ Grant No. 2009-DN-BX-K232. National Institute of Justice.

Wolfe, A., Mealy, C., Gottuk, D. (2009). Fire Dynamics and Forensic Analysis of Limited Ventilation Compartment Fires, Volume 1: Experimental, NIJ Sponsored. NCJ 230164.

Wolfe, A., Mealy, C., Gottuk, D. (2009). Fire Dynamics and Forensic Analysis of Limited Ventilation Compartment Fires, Volume 2: Modeling, NIJ Sponsored. NCJ230165.

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

3b. In what ways would the research results improve understanding of the scientific basis for the

subcommittee(s)?

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

This research will help the fire investigation community to apply a more systematic approach to the results of fire pattern analysis.

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

	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:

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

SAC

1. Does the SAC agree with the research need? Yes No
2. Does the SAC agree with the status assessment? Yes No

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

Approval date:

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