



RESEARCH FOUNDATION

RESEARCH FOR THE NFPA MISSION

Female Firefighter PPE: Investigation of Design, Comfort, and Mobility Issues for Female Firefighter Personal Protective Clothing

Last Updated: 10 December 2019



Background:

Structural and wildland firefighting turnout suits are primarily developed for the male firefighter, despite the growing number of women firefighters in the fire protection community. Women firefighters wear the same turnout suits as their male counterparts and are at a higher risk of injury and fatality due to ill-fitting PPE. Research has found that female firefighters are wearing turnout suits that are not sized for the female human form and therefore possess an unsatisfactory fit. Sizing data from other organizations have demonstrated the need for uniforms to be designed specifically for women and that simply sizing down the garment is not an appropriate solution. This research will provide the practical and marketing bases for the initial steps of developing a female turnout suit that meets NFPA standards.

Implementation and Schedule:

This research project is led by Florida State University and North Carolina State University with collaborative support from the Fire Protection Research Foundation. Funding for this project is through a DHS/FEMA AFG Fire Grant with a targeted project completion within two years starting from September 2019. The Principal Investigator (PI) for this project is: Dr. Meredith McQuerry of Florida State University, email: mmcquerry@jmc.fsu.edu



Project Goal:

To research and investigate the root causes of design, comfort, and mobility issues of firefighter personal protective clothing for the female human form.

Project Methodology:

This study involves the following tasks:

Task 1: Development of Project Technical Panel. Develop Extended Expert Team and Refine Project Strategy. A Project Technical Panel (PTP) will be established to confirm the project plan and identify potential challenges. The PTP will represent the emergency response community and will provide feedback on the ongoing project efforts from design through dissemination and implementation.

Task 2: Market Survey, Literature Review, and Preliminary PPE Manufacturer Focus Group.

Conduct a literature review of the existing turnout suits for female firefighters and how the equipment developed for men impacts the functionality of the PPE for the female form. This task will also consist of a market survey, where focus groups will be held with manufacturers to review the personal protective clothing (PPC) currently available for female structural and wildland firefighters.

Task 3: Survey Development and Distribution. An in-depth questionnaire will be developed to obtain data to the end user's experience and impact from wearing their current PPC. The survey will be distributed broadly throughout the US.

Task 4: End User and PPE Manufacturer Focus Groups. Following the preliminary data analysis, a focus group methodology approach for local and U.S. regional end users will be developed and implemented to encourage and obtain responses for a better understanding of the perceptions and opinions regarding female personal protective clothing. Focus groups will be held for approximately 200 female first responders to engage in in-depth discussions around the impact of their current PPC and body scans to provide better data on the fit and design challenges of PPE for female first responders. After completion of the local and U.S. regional end user focus groups and body scans with female first responders, a secondary face-to-face focus group with partnered PPE manufacturers will be held. Analyzed and anonymized results from the widely distributed end user survey and focus groups will be shared to discuss the challenges and barriers manufacturers face when designing and marketing to the female first responder population.

Task 5: Analysis, Reporting, and Dissemination. All data and information collected in the previous tasks will be analyzed and documented through a final report, PPE market survey database, and a suggested sizing guideline specific to wildland and structural firefighter user-groups.

Project Deliverables:

This research will contribute to ultimately improving female firefighter protection from high risks of injury or fatality due to design and mobility issues from the current turnout suit.