THE FIRE PROTECTION RESEARCH FOUNDATION

PROJECT SUMMARY

Non-Destructive Assessment of Outer Shell Degradation for Firefighter Turnouts

3 July 2014

Background: Current retirement criteria for firefighter outer shell materials has a set time limit as defined by NFPA 1851, *Standard on Selection, Care, and Maintenance of Protective Ensembles for Structural Fire Fighting and Proximity Fire Fighting*. However, this time limit does not compensate for amount of usage and exposure time, i.e., a major city fire department versus a rural fire department fire volume. A non-destructive method is needed to evaluate the outer shell integrity to determine when a garment is no longer protecting the wearer at peak efficiency.

Research Goal: The purpose of this project is to determine whether Fourier Transform Infrared Spectroscopy (FTIR) can be used to non-destructively measure the degradation of outer shell fabrics of firefighter turnouts.

Project Tasks:

1. **Task 1: Establish Testing Plan.** Establish an overall testing plan for non-destructively assessing degradation of firefighter outer shell materials. The testing plan should be based on guidance from the Project Technical Panel and include details on proposed scope of work, tasks, anticipated deliverables, and budget. The testing and sampling plan should also specifically account for the following:
    a. Number of samples required,
    b. Sources of samples,
    c. Configurations of outer shell material degradation being tested, i.e., conditions of use being assessed,
    d. Method for degradation of samples.
2. **Task 2: Conduct FTIR Testing.** Utilizing the Testing Plan established in Task 1, collect FTIR measurements of outer shell samples of varying degradation levels.
3. **Task 3: Final Report.** A final report communicating the results of testing and recommendations for implementation of non-destructive assessments in practice.

Implementation: This research program will be conducted under the auspices of the Fire Protection Research Foundation in accordance with Foundation Policies and will be guided by a Project Technical Panel who will provide input to the project, recommend contractor selection, review periodic reports of progress and research results, and review the final project report.

1 Batterymarch Park, Quincy, MA 02169-7471
Telephone: +1.617.984.7281 Fax: +1.617.984.7010
Email: Foundation@NFPA.org www.NFPA.org/Foundation

Schedule:

Task 1:	4 months after project initiation
Draft Final Report:	11 months after project initiation
Final Report:	12 months after project initiation