

## Deploying Physiological Status Monitoring (PSM) in the Fire Service

### BACKGROUND AND MOTIVATIONS

- Overexertion, stress, and medical issues account for nearly 50% of firefighter on-duty fatalities.
- Recent developments in wearable technology have made it possible to monitor cardiovascular and thermal strain.
- The Wearable Advanced Sensor Platform (WASP; comprised of a Globe NFPA-approved flame-resistant base layer shirt and Zephyr Bioharness 3 technology) provides real-time and recorded heart rate and estimated core temperature.
- The SMARTER team deployed the WASP system among 54 firefighters at Hanover Park Fire Department to explore the feasibility of monitoring during training, calls, and 24-hour shifts.

### CHALLENGES

- Ensuring that the strap and/or shirt was tight and conductance strips were prepared so quality data could be collected
- Irritation, rash, and discomfort from prolonged use of the shirt and/or strap may interfere with use and compliance
- Managing large amounts of data
- Having threshold limits for alerting
- Identifying who will monitor data and determining when action can be taken based on physiologic data
- Privacy/confidentiality concerns

### KEY FINDINGS AND RECOMMENDATIONS

- The WASP system has been used by several fire departments during training and rehabilitation.
- In its current configuration, the WASP system is best tolerated during short term use during training and for research. It would require additional manpower to review outputs for use during emergency calls.
- Improvements in comfort and wear-ability are likely needed for widespread adoption for prolonged use.

