

### WILDLAND FIRE RESPIRATORY RISKS

Every year, wildland firefighters are exposed to many of the same respiratory hazards that structural firefighters avoid by using Self-Contained Breathing Apparatus (SCBAs).

Unfortunately, wildland firefighters cannot use SCBAs. Sore throats, headaches, and respiratory damage are commonplace in the wildland firefighting community. A scarf is the only respiratory protection for many wildland firefighters, and its protection is minimal. A firefighter's participation in wildland firefighting usually ends when they are no longer willing to subject themselves to more respiratory damage.

During the 2018 California Camp Fire, many wildland firefighters reached their respiratory damage limit and retired from fighting wildfires. For some, the respiratory damage they absorbed during that incident also ended their structural firefighting careers.

Reasons wildland firefighters give for avoiding using respiratory protection include the intolerable breathing resistance or increased heat load that masks can produce. However, respiratory protection for wildland firefighters can be tolerable when using Powered, Air-Purifying Respirators (PAPR) specifically designed for the hazards of wildland firefighting.

### SOLUTION: DHS S&T's WILDLAND RESPIRATOR PROGRAM

Wildland firefighters need a small, lightweight respirator that is easy to don and doff. Under the Department of Homeland Security (DHS) Science and Technology Directorate's (S&T) Wildland Firefighter Respirator project, TDA Research is developing such a respirator capable of removing airborne hazards in the wildland firefighting operating environment.

S&T, California Department of Forestry and Fire Protection – International Association, International Association of Fire Chiefs, U.S. Forest Service, and local Colorado fire departments have all contributed to the development and testing of TDA's Wildland Respirator and are stakeholders in its development.

TDA's Wildland Firefighter Respirator (WFR) contains a HEPA filter module that will remove very fine particulates and a carbon sorbent to remove toxic gases. The team is certifying



wildland firefighter-approved hip-mounted PAPR units that meet this requirement (shown above).

If wildland firefighters used respiratory protection, their careers could be significantly extended, leading to a more educated and experienced workforce capable of more efficient operations, with lower medical bills and training costs.

### IMPORTANT MILESTONES ACHIEVED

- Voice of the customer meetings were held with multiple firefighters to provide feedback on the prototypes. Feedback received will prove invaluable in steering the designs towards respirators that the wildland firefighting community will accept.
- An Operational Field Assessment (OFA) was held at the Harbison State Forest, Columbia, SC, in May 2022. Evaluators performed simulated wildland firefighting activities in vehicles and on foot to assess the capabilities of this technology.

### UPCOMING MILESTONES

TDA will continue to enhance the respiratory capabilities of the WFR while working to identify a manufacturing partner. These enhancements as well as extensive testing will lead to the assessments required for National Institute for Occupational Safety and Health and National Fire Protection Association certifications.

### PERFORMERS/PARTNERS

First responders interested in assessing the prototype WFR include: Los Angeles County Fire, Olathe Fire, Fairmount Fire Protection District, South Carolina Forestry Commission, and the Colorado Division of Fire Prevention & Control.