coloradoan.com
Connect with your community.

October 14, 2009

CSU profs get $917,000 grant to further develop technology to cool firefighters

BY NATE TAYLOR
NateTaylor@coloradoan.com

A group of CSU engineering professors has received a $917,000 grant to help make a product ready for market that would keep firefighters cool inside their heavy fire-proof gear, an issue nationally regarded as one of the biggest concerns facing firefighters.

Tom Bradley, the Colorado State University professor leading the effort, said he and other professors and students will be using the money, which was awarded by the U.S. Department of Homeland Security, to improve an air pack already developed by Longmont-based Niwot Technologies.

Niwot's prototype product is called the SuperCritical Air Mobility Pack, which was developed for NASA, and uses cryogenic, or extremely cold air, to provide breathing air in a thin, compact case.

"The idea is that this pack that Niwot Technologies has developed can be improved to provide both breathing air and cooling from a single pack," Bradley said. "It makes sure firefighters can be fully functional the entire time they're fighting a fire or whatever it is they're doing."

Bradley said the National Fire Protection Association pointed to heat stress as one of the most serious issues facing firefighters and that the group estimates about 43 percent of line-of-duty deaths are the result of cardiovascular failure, which can stem from repeated heat stress.

Heat stress is compounded by the heavy, fire-proof ensemble firefighters have to wear for protection, which can make the heat feel like having 10, 60-watt light bulbs under your coat, Bradley said.

"It's tiring. It's painful. It's bad for your heart and it's bad for your health. It's stress," he said.

Another problem caused by heat stress is inefficient productivity because firefighters are forced to, on average, take a half hour cool down period for ever two hours spent fighting fires.

"In many parts of the country, for many parts of the year it's hot outside and these guys overheat in their coats," Bradley said. "Obviously the way to deal with that is to… try and make it so firefighters don't get heat stress in the first place."

Poudre Fire Authority firefighters will help Bradley, as well as Professors Wade Troxell and John Williams, in the design review and field testing of the airpack.
Patrick Love, spokesman for PFA, said the thin and compact design of the airpack can make a huge difference for firefighters.

"In order to make a fire fighter's ensemble more user-friendly, it requires less weight, less cumbersome clothing and a smaller package," Love said. "It basically equates to saving firefighters' lives and making our job more efficient and effective. We want to provide the maximum amount of protection with the least encumbered ensemble."

The professors and engineering graduate students working on the project will also attempt to adjust airpacks used by firefighters involved with hazardous materials cleanups.

HazMat crews often wear protective suits for hours at a time and cooling is particularly important for them, Bradley said.

"They're really doing their work for four hours at a time and that's outside the scope of what cooling technologies can currently do," he said. "We're trying to adapt these technologies that Niwot has developed… we're trying to supply air from the outside so it's not like firefighters would have to carry the air on their back. The goal is to provide cooling and supplied air for four hours."