

Situational Awareness Firefighting Equipment (SAFE)

.....The Future of Fighting Wildland Fires

SAFE is an initiative to bring today's technology to the Wildland firefighting mission.

SAFE leverages technology developed to support DoD's Special Forces operations. Fighting Wildland fires has similarities to combat in that both involve dangerous missions with small units deployed over a wide area, a central command structure, air, vehicles, and ground teams, all operating in a dynamic hostile environment.

SAFE goals include the identification and deployment of new technologies that will significantly increase the level of safety to fire fighting forces and reduce fire suppression costs.

SAFE Objectives

- ❖ 24 hour fire fighting operations
- ❖ Real time command and control capability
- ❖ Improved situational awareness
- ❖ Enhanced ability to order resources and prioritize resource requests
- ❖ Improved accuracy of resources deliveries
- ❖ Improve operational effectiveness

Users

The Hot Shot crews and Smokejumpers are the initial users targeted for SAFE as they are best equipped to prevent a fire from becoming a mega fire. Initial users will include ground fire fighters as well as dispatchers operating in a central command center.

Technology, Application, Innovation

Portable Hardware – Commercially available devices that collect GPS positions and interface to a communications link providing Situational Awareness

- ❖ Handheld Communications Such As a Portable computer or PDA
- ❖ Moving Map Displays
- ❖ Night Vision Goggles
- ❖ Custom Built Clothing
- ❖ Satellite Phones
- ❖ Wireless GPS Devices
- ❖ Manned and unmanned vehicles (ground and airborne)

Situational Awareness – Positional and intelligence data shared with on-scene, remote dispatch center, and decision makers

- ❖ Everyone Sees Everyone
- ❖ Real Time Fire, Weather, And Safety Information
- ❖ Links Between Aircraft, Ground Vehicle, And Fire Fighters

Communications Link –Satellite networks allowing for fast, secure access regardless of geographic location and Local Area Wireless Link allowing for scene of action communications

- ❖ Two Way Text Messaging

Command and Control – Ground hardware and software that store and display 3D images of the fire and surrounding areas

- ❖ 3D Imaging Software

Remotely Operated /Unmanned Aircraft For SAFE project

The SAFE project sponsor has stated a goal of "owning the night" in future wildland fire activities. To be successful in this concept situational awareness and command and control systems would have to be operational with or without airborne intelligence. However there are situations when airborne applications would not only be a tremendous advantage, it may be required for operations.

Technologies being considered;

- Daylight and thermal imaging
- Data link and communication relay
- Weather sensors

These same technologies may also be applied to other natural resource, law enforcement, and security missions. We will continue to actively seek internal and external partners.

The target mission for a starting point (which can be expanded upon) is problem extended attack fires and night operations on Mega fires. The concept would be deploying a small highly trained force of technology enabled firefighters with a highly mobile rapidly deployed operations center. This operations center maybe a vehicle or a trailer that can be pulled by a four wheeler or flown in. It could also have a tower, balloon, or small hand launched ROA.



There are larger aircraft that could meet and in some cases exceed these mission capabilities; however the cost, coverage area, response times and airspace issues it appears a quicker entry point will be smaller, less expensive, stay local, low flying, night time platforms.

The goal would be meeting all of the requirements with hands on real world evaluations. It may also include a range of technologies that are deployed based on the dynamic needs of each mission. The starting point is a market survey of available technologies. Then select a handful of technologies and design specific tests with end users participation.

We are planning to start with small hand launched Remote Controlled aircraft (there has been an explosion of this technology) to help define advantages, disadvantages and limitations. We then will scale up the on board technologies to include video, high resolution still frame and wireless data links. The next will be autonomous GPS flight and the last a thermal camera. We then may conduct demonstrations under highly controlled environments on real incidents.



Part of the tests will be how do we deliver products, to whom and how often. It will include to hopefully define spatial and temporal resolution of information for tactical decision making.

These sensors payloads may also migrate to manned aircraft.

Samples of technologies:



Electric RC manually flown airplane with daylight video and 2 mega pixel camera. Includes 2.4 GHz data downlink.

Total system less than \$1,000



Electric manually flown Helicopter with wireless video camera.

Miscellaneous autonomous aircraft: \$20,000- \$200,000

