# PCADS BRING THE RAIN!

Despite the fact that it's just barely into springtime, wildfires are already occupying the minds of many officials the world over. Whether they are known as bushfires, veld fires, waldbrands, incendio forestales or any of a number of different names depending on where they burn, in a warming climate these destructive phenomena are becoming all too common. New ideas are needed and now there is the Precision Container Aerial Delivery System (PCADS). **Michael Archer** Reports.

n March 1, 2019 the Emergency Management Service of the European Union reported that there had been 480 wildfires that had broken out across Europe since the first of the year.

On March 22, 2019 California Governor Newsom declared an emergency ahead of the wildfire season, mobilizing the National Guard and supporting CAL FIRE's plans to conduct a crash program of vegetation thinning to head off another wildfire season like the one in 2018, when 8,527 wildfires burned nearly 2 million acres statewide, killing 98 civilians and 6 firefighters, and destroying an estimated 19,000 structures at a suppression cost of nearly $2 billion.

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To combat worsening wildfires, fire agencies are deploying aircraft to support the firefighters on the firelines. But fires burning in difficult terrain only accessible by planes diving through steep canyons invites disaster, as has been the case all too often.

On June 17, 2002, a C-130A Hercules (Tanker 130) was flying on the Cannon Fire near Walker, California, when its wings came off during a dive to drop retardant. All three aircrew were killed.

On July 1, 2012, a North Carolina Air National Guard C-130 MAFFS (Mobile Aerial Fire Fighting System) air-tanker was flying on the White Draw Fire near Edgemont, South Dakota, when a microburst produced by a thunderstorm drove the low-flying aircraft into the ground, killing four crew members and injuring two others.

On October 7, 2014, a CAL FIRE S-2T (Tanker 81) was flying on the Dog Rock Fire in Yosemite National Park near El Portal, California, when it is believed that the plane struck a tree and crashed, killing the pilot.

The common denominator in all three of these crashes was that the planes were flying relatively close to the ground, diving on a wildfire. Aerial firefighting can be a dangerous business and, with fewer air-tankers available than were flying less than 20 years ago, combined with many more incidents to which they need to respond, it is becoming even more so.

But could there be a better, safer way to fight fires from the air?

## PRECISION CONTAINER AERIAL DELIVERY SYSTEM (PCADS)

PCADS is an innovative aerial delivery firefighting system which uses a patented bottom skidboard/tray, sleeve and top cap design to secure a 2,000 lb. bladder filled with water, firefighting gel, or any other firefighting chemicals.

PCADS was originally envisioned by a Boeing Aircraft employee, William Cleary, back in 2004 when he saw a kid throw a water balloon from a third story balcony down onto the ground, showering the area with water. Cleary envisioned multiple 'water balloons' being dropped from Boeing's C-17 Globemaster transport plane onto a wildfire. The team he put together to bring his idea into reality quickly realized that having the container burst on the ground would not be effective in extinguishing a wildfire and knew they needed to find a way to burst the 'water balloon' over the fire so that the water or fire retardant would rain down over the blaze (direct attack) or drop the 'balloons' in a line along the ground to form a containment line (indirect attack).

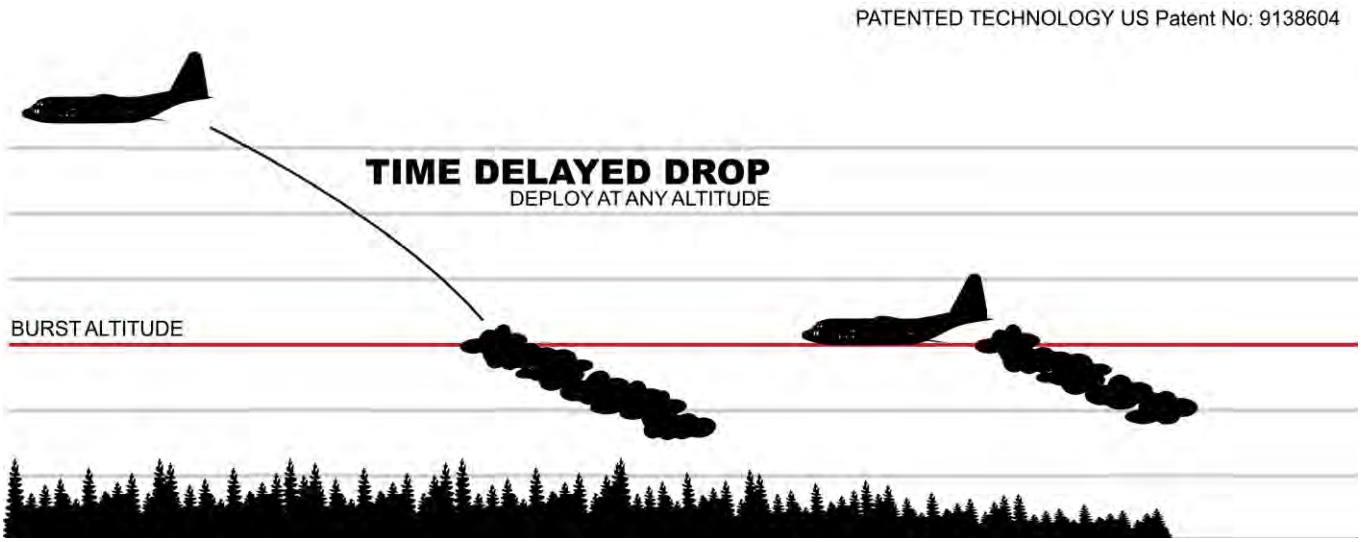
The result was a unit which consists of a 48"x48" skidboard, with a bottom tray and sleeve system that contains a 250 US gallon bladder, and is secured to the skidboard via a patented intrinsic vertical restraint system. A top cap is then placed on top of the sleeve and is attached to the vertical restraint and the bladder rip cords. Once the bundle is dropped from the aircraft, the top cap separates from the sleeve, cuts the vertical restraint, and pulls the rip cords, rupturing the bladder, causing the contents to rain down. Each unit can be pre-set through a patented time delay system to open


at a chosen altitude, so an aircraft can fly over a wildfire at a safe height, like 5,000' AGL (above ground level), when it performs a drop. The aircraft simply tips the nose up over the target and the PCADS units roll out the back, which is much safer and easier to do than having to dive down close to the ground, maneuvering through canyons, like most air-tankers do.

And the best thing about the PCADS unit is that it can be dropped out the back of an existing, unmodified transport aircraft using the same methodology that the military has used for decades to deliver supplies and equipment to frontline troops. "Aircraft types which can use this unique firefighting system include the C-130 Hercules, L-100 (commercial C-130 variant), C-17 Globemaster, KC-390, C-27 Spartan, V-22 Osprey, and even helicopters like the CH-47 and CH-53," said Ty Bonnar, CEO of Saint Industries. Many of these aircraft are available on military bases across the U.S. and around the world.

## NO EXPENSIVE MODIFICATIONS NECESSARY

PCADS can be used by military and civilian transport aircraft without the costly modifications to aircraft usually required before they can fight a wildfire. "The cost to modify an aircraft into an air-tanker is extremely expensive, around $9 million for a C-130, and once these modifications have been completed,




the aircraft is restricted to the aerial firefighting mission from that time forward, when it sits it costs money too," said Bonnar. But with PCADS, no modifications are necessary. You simply load them onto a transport plane like you would any other cargo, tie them down, and take off.

Unlike conventional air-tankers that often have to have lead planes guide them in to the drop point or worry about visibility when flying over areas clouded by wildfire smoke, PCADS can be dropped with excellent accuracy using Global Positioning Satellites (GPS). Just provide the GPS coordinates to the transport pilot and the PCADS load can be delivered on target from a safe altitude. No death-defying, seat-of-the-pants flying is required to deliver a load of gelled water, retardant, or plain water on a fire. This vastly increases the safety factor on drops, not to mention reducing strain on the transport aircraft's airframe (and the aircrew's nerves).

One other feature of PCADS which fire managers favor is attacking a wildfire from the air at night and during high winds when air-tankers are grounded. What has previously been far too dangerous for fixed-wing air-tankers, night attack on wildfires is simplicity itself with PCADS. As with daytime operations, the transports need only know the GPS coordinates of the target to fly into the fire zone at a safe altitude, drop their PCADS load when they reach the coordinates, then fly home to reload for another mission. No lead plane or daylight required.

## MILITARY TRANSPORTS – THE FORCE MULTIPLIER

By using PCADS, military transports could now swell the numbers of aircraft available for the wildland firefighting mission. All of those transport aircraft, which have been forced to sit on the sidelines while a handful of MAFFS-equipped C-130s join a few military helicopters and tilt-rotors with Bambi buckets fighting wildfires, can finally be utilized.

How long does it take to load a transport with PCADS units? "It would take 15-20 minutes to actually load PCADS into a C-130 transport," Bonnar answered. "Once an airbase receives a call to dispatch a C-130 to a fire it would take 30-60 minutes to get the plane loaded and airborne."

Many countries have military transport planes capable of carrying PCADS. For all branches of the U.S. military, they are already fully trained for the mission of deploying cargo as part of the Container Delivery System (CDS). This approach is also used by many civilian transports, both foreign and domestic. "The PCADS basic CDS design allows it to be deployed from any civilian airframe having standard cargo carrying rails and rollers with an aft ramp," Bonnar confirmed.

PCADS units can be stored at an airbase for prolonged periods of time, ready to use at a moment's notice. And since most of the components used to create PCADS units are dry, not liquid, they can be stored indefinitely until they need to be assembled. Saint Industries has developed a method whereby PCADS units can be put together in no time. "It takes two people just 8 minutes to put one together," Bonnar explained. "We typically set up a production line. A crew of 6 can build approximately 80 units in an 8-hour day."

## PERSONAL ANGLE

PCADS is not being designed and manufactured by an organization that is detached from wildfires. Saint Industries, which is located in Simi Valley, California, got up close and personal with a wildfire on November 8, 2018. "We had the Woolsey Fire here, which

directly affected Simi," Bonnar recalled. "From the office door I could see the fire coming down the hill towards us, along with a very limited air attack due to the high winds."

The delays chafe at Bonnar. "I am so frustrated to see that, while our backyard burns, that the bureaucracy has slowed the wheels on this. We have a system that could have helped. It can be flown during high winds and at night time. Access to the Woolsey Fire was limited by terrain, but PCADS could have reached it."

And Bonnar is not the only one who feels that delays in deploying PCADS is a bad thing. Congressman Dana Rohrabacher sent a letter to the Secretary of the Air Force on August 30, 2018, pointing out that the military's "bureaucratic inertia" has led to a needless loss of life and tremendous loss of property to wildfires across the West, stating that "this loss of life and property could have been dramatically curtailed had our military acted upon an option that was, and is, readily available," namely PCADS.

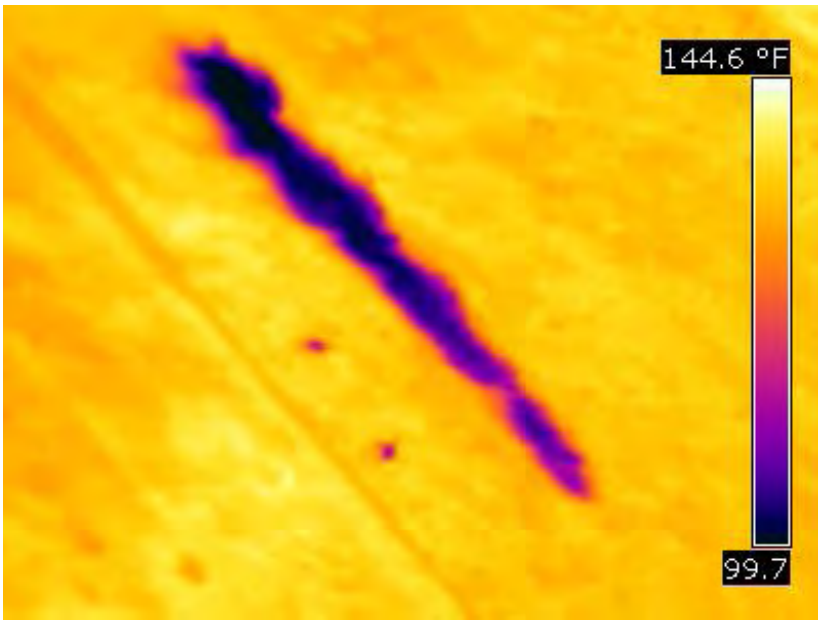
At a press conference in Orange County, California, the Congressman praised PCADS and urged officials and the military to approve the product for use by military assets against ever-worsening wildfires in the U.S.

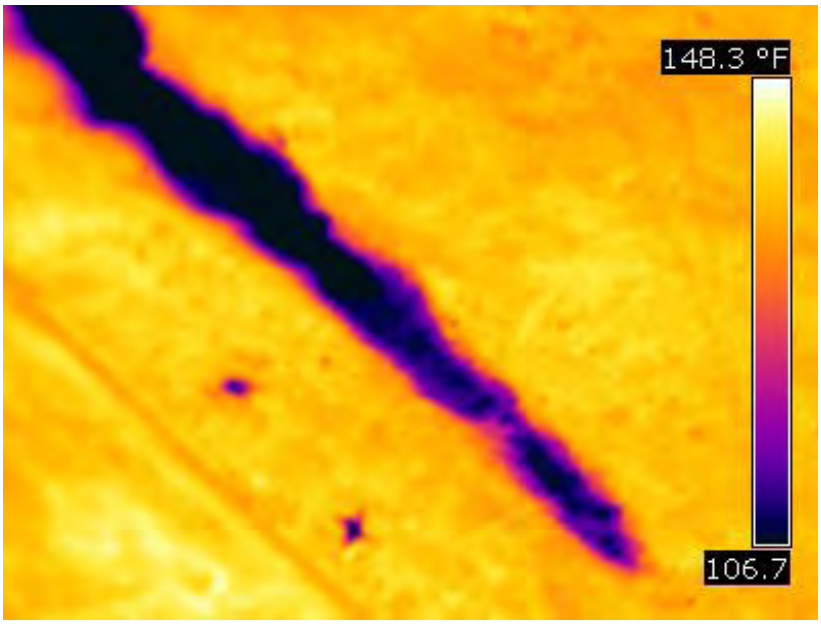
## MOVING FORWARD

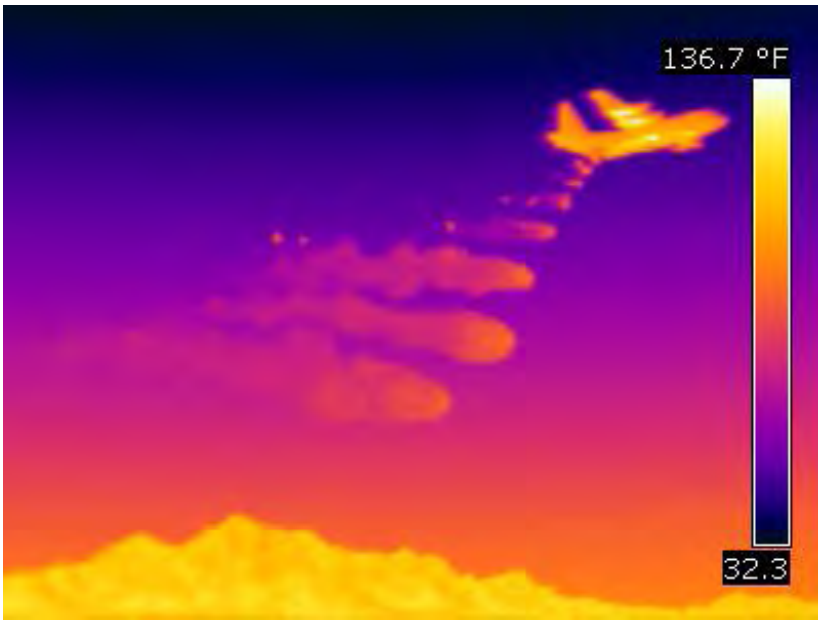
The military, particularly the Air National Guard (ANG), likes what it sees, as Bonnar detailed. "In the 2015 US Air National Guard Domestic Capability Priorities document, Resolution #30 was crafted and, calling out a CDS Aerial Firefighting System, was published on the Critical Capabilities List, and started the road forward for the 2017 Operational Utility Evaluation [OUE] of PCADS as a solution to this critical capability requirement." PCADS passed the OUE conducted by the ANG Test Agency and the final report was published earlier this year.

Multiple state ANG Units are working with Saint Industries to add the Containerized Aerial Firefighting System (CAFFS), as the military refers to it, to their other current methods of airdrop. "My focus right now is getting the Air National Guard to adopt this capability for the 2019 fire season," said Bonnar. "We are in the process of training and preparing the ANG for this mission.

"The ability to deploy multiple aircraft rapidly with highly-skilled warfighters is awesome, and these assets now have the capability to come in and directly attack the fire with 4,400 gallons per plane. Imagine multiple C-130s flying in formation, dropping onto a wildfire. This has never been done before."



But it's not just the U.S. military that is taking a close look at PCADS. Governments in other parts of the world that are having problems with wildfires have also contacted Saint Industries for more information on their unique firefighting system. "PCADS has also been adopted as the Royal Thai Air Force's Aerial Firefighting System, with several other countries preparing to adopt PCADS as well," Bonnar said proudly. "We will be training the RTAF C-130H squadron in Q2 of 2019 for two weeks just outside of Bangkok, going over PCADS from A-Z and live dropping, too!"

And in the past few weeks, Thailand probably wished they had signed on sooner, in a year that has seen 900 wildfires erupt nationwide, with nine counties in the northern province of Chiang Mai complaining that air pollution from wildfire smoke is reaching dangerous levels.

"The Royal Thai Air Force is the trendsetter and truly believes in the benefits of PCADS," said Bonnar. "They have had MAFFS in the past, but the wing commander said that those have been broken for years and just sit off to the side now."

The Thais have 12 C-130H in their inventory and Bonnar believes they intend to outfit multiple aircraft for this first go-round. "We just provided them with 3 sets of CDS kits, so we know they will have 3 PCADS-capable Hercs by the end of June, and for less cost than any other aerial firefighting system. They are gearing up and we are honored to be their company of choice. We are also training them on dual rows of CDS and other aerial delivery systems that will enhance overall airdrop missions."

Thailand is not the only trouble spot in Southeast Asia, either. India has had major wildfires in several states, with blazes in Karnataka State reaching a national emergency level in February and early March.

Indonesia, too, has seen 2,719 hectares go up in smoke in Riau Province alone. And there are concerns that the infamous Transboundary Haze, smoky conditions brought on by rampant wildfires on Sumatra Island, may once again impact tourism across Southeast Asia.

As wildfires worsen across the globe, Saint Industries can be assured of one thing in regard to the market for PCADS: it's a target-rich environment. **AA**