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PCADS

PCADS (Precision Container Aerial Delivery System)

AERIAL DELIVERY FIREFIGHTING

Flexible Attack Innovations

- Flexible Attack Innovations (FlexAttack) is a unique fabrication company located in Simi Valley, CA – 40 miles northwest of Los Angeles. For over 22 years, FAI has been an industry leader and a "go-to" company for the specialty liquid transportation and fabrication services we offer. We have worked hard to build a rock solid reputation over the last 18 years with our customers and industry; conducting business with professionalism, integrity, reliability and innovation. We have provided services to a wide array of customers from Fortune 500 companies to small start-ups, International Companies along with the United States Government and Foreign Governments/Militaries.
- Our products and services cover a wide spectrum of markets: Food and Agriculture, Chemical, Petroleum, Industrial, Humanitarian and Military. We have worked in over 52 countries, in all types of environments and terrain.

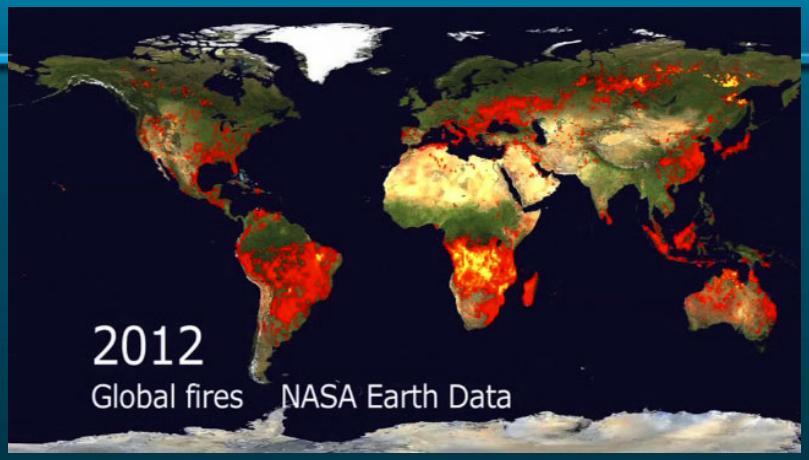
The Current Issue

- **WILDFIRES** - A Global Crisis exists today. Various Studies all indicate that a new fire cycle started in 2010. This cycle will last 30 years.
- Climate change and weather patterns indicate that 16 biomes will experience drastic increases in wildfire events.
- ALL resources will be stretched and budgets will run over due to more fire activity. Civilian and Military forces will have to work together to combat this threat.
- Time for a new tool. Precision Container Aerial Delivery **PCADS**, a true force multiplier.

The Growing Threat of Wildfires Around the World

- A study conducted by UC Berkley found that rising temperatures will likely cause more fires across most of North America and Europe over the next 30 years.
- Scientists using NASA satellite data and climate models have projected drier conditions likely will cause increased fire activity across the globe in the coming three decades.
- Fire Events in North America, Europe, Russia, Australia, Mexico, South America, Africa and Asia are all experiencing increased fire seasons.
- Fire Season is ALL Year NOW!!!

Global Wildfires



- Studies indicate that a fast initial attack on a wildfire can reduce the growth potential drastically, saving property, time and costs.
- Air attack has proven to slow wildfires.
- Countries need to increase their Air Attack Capabilities to better enable them to slow wildfire growth and reduce burn times.
- Reduction in growth and burn times SAVES land, property, lives, risks, suppression costs and environmental impacts such as flooding , wildlife, forest loss and carbon emissions.

PCADS
A Sensible Solution

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- **P**recision **C**ontainer **A**erial **D**elivery **S**ystem
- A cost-effective system that allows multiple C-130's to mobilize on a wildfire within minutes of the call. **PCADS** provides the Air National Guard the capability to protect state lands and people with an innovative new firefighting tool.
- Allows multiple aircraft to direct attack the fire at a safe altitude, with no expensive retrofits to existing airframes.

What is **PCADS**?

- A unique and innovative aerial delivery system, **PCADS** primary operation allows airdropping of suppression media onto wildfires.
- Airdropping allows immediate and accurate response by an airdrop capable platform to extinguish wild land fires 24/7. **PCADS** has been designed to be used by military transport airlifts. C-130, C-17, C-27, IL-76, V-22, CH-53.
- **PCADS** is designed to disassemble upon air stream impact creating a “rain” effect of the media to extinguish wild fires.

PCADS Units

- Precision Container Aerial Delivery System (PCADS) is a 1 ton Corrugated Bladder System CDS bundle that is used to deliver mass (4,000+USG) of suppression agents onto wildfires via military cargo aircraft.
- Individual units contain 250 USG of liquid. Multiple PCADS can be air dropped from the following airframes:
  - C-130E/H 16 PCADS 4,000 USG
  - C-130J 20 PCADS 5,000 USG
  - C-17 40 PCADS 10,000 USG
- Attributes of this design are:
  - It conforms to US Air Force Container Delivery System (CDS) specifications allowing routine use by military cargo aircraft and CDS trained aircrews.
  - It is designed for direct attack on the fire rather than existing aerial firefighting systems that are used to contain fires.
  - It readily supports the use of water additives for enhanced firefighting effects such as gel, foam, and retardant.
  - Certified by USAF/AMC

PCADS
Rapid Deployment

- **PCADS** can be positioned throughout the country for immediate response to a wildfire threat.
- **PCADS** can be prepared and stored ahead of fire season, reducing response times.
- One C-130 can hold 4,000 USG of Water Enhancer or Retardant. 16 **PCADS** per aircraft.

PCADS can be stacked 3 tall FULLY loaded – 2,000 lbs each. allowing for immediate response when a wildfire occurs.

PCADS
Operations

- **PCADS** dramatically increases the number of aerial firefighting assets available to respond to wildfire emergencies. By virtue of its conformity to CDS procedures, it assures the availability of a large pool of qualified airdrop aircrews. Large numbers of aerial firefighting assets creates the capability to directly attack and extinguish wildfires. Force Multiplier.
- Prior to **PCADS**, aerial firefighting assets were available in such limited numbers that they were used to steer wildfires into natural obstacles such as rivers, canyons, and roads where the fire would hopefully burn itself out. This approach is problematic because adverse winds could carry embers across such barriers with regularity. So, this approach is dependent on having such barriers and having the right combination of atmospheric conditions occur simultaneously.
- **PCADS CONEMP** is daytime and nighttime operations. **PCADS** opens the capability window 100 fold – 250' AGL Daytime and 1000'+ AGL for nighttime operations. PCADS will still function and operate in the same manner bursting <250' AGL above the fire using delay devices.

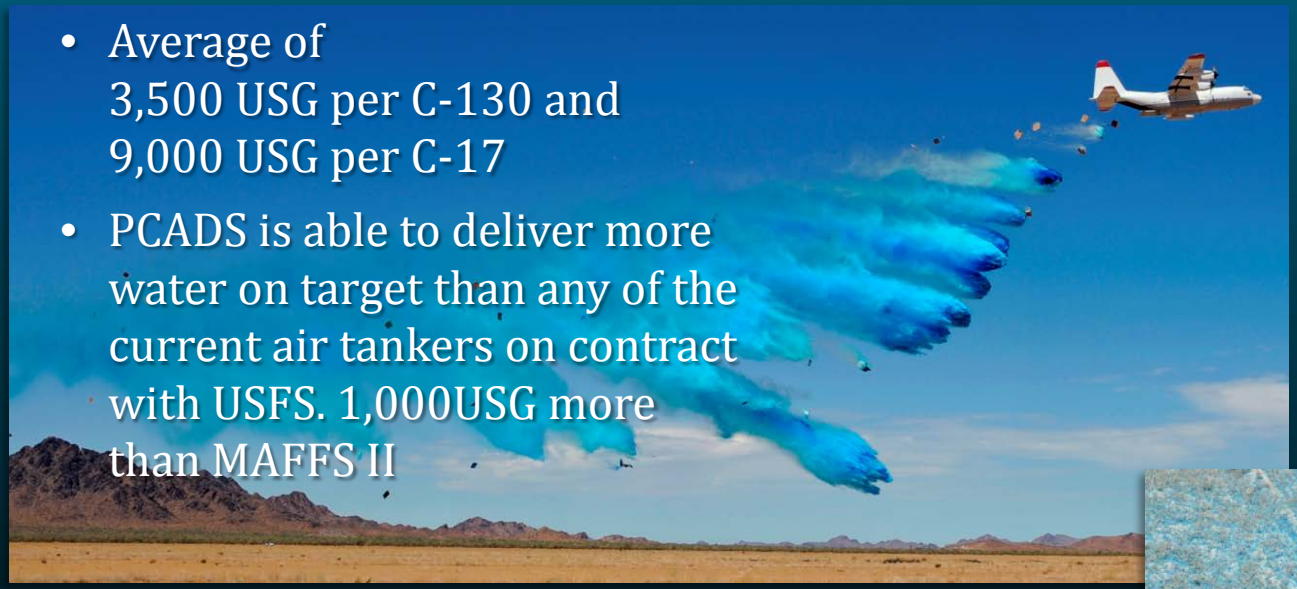
PCADS
Force Multiplier

- Hundreds of C-130's can be turned into Aerial Fire Fighters
- Each C-130 can transport 16 tons (4,000USG) of water or fire suppression
- Mass Attack – Direct Attack
- Multiple Aircraft in formation

PCADS
vs. Today's Airtankers

- Existing aerial firefighting systems consist of water tanks and release mechanisms that either allow the firefighting agent to freefall or be pumped overboard from the aircraft.
  - Delivery is dependent on a release approximately 300 feet or less above the target to ensure minimal evaporation prior to the agent reaching the wildfire fuel.
  - In order to assure these conditions are met, the aerial firefighting aircraft typically must dive-bomb the target. Employment of this tactic is problematic because it requires unobstructed visibility and a safe climb out path.
- In rugged terrain, flight safety is an issue while trying to meet aerial firefighting requirements.
  - With PCADS, the firefighting agent is loaded in each container such that the firefighting system is like any other cargo load. As a result, the PCADS aircraft is not dedicated to only aerial firefighting.
  - The PCADS delivery technique uses level flight to gravity airdrop over the target.
  - The PCADS integral timing mechanisms allow the level flight altitude above the ground to be varied to increase flight safety while assuring PCADS opening at effective altitudes.

PCADS
Aerial Delivery



- Average of 3,500 USG per C-130 and 9,000 USG per C-17
- PCADS is able to deliver more water on target than any of the current air tankers on contract with USFS. 1,000USG more than MAFFS II

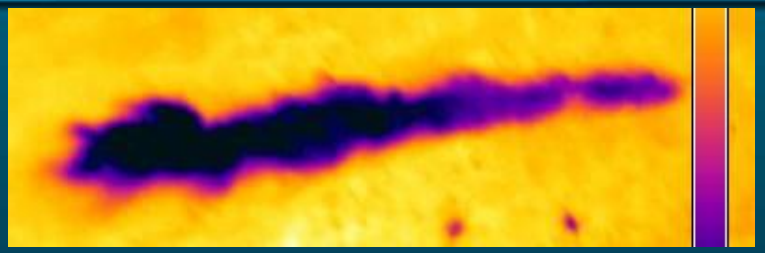
PCADS can STOP fires in the first 24 hour operational period.

PCADS is able to deliver more product on target and with multiple C-130's perform Mass Air Attack. Using Direct Attack Tactics, PCADS could be used as a containment tool if needed.

PCADS opens a new operational window that has yet to be opened.

PCADS
Drop Patterns vs. Other Air Tankers

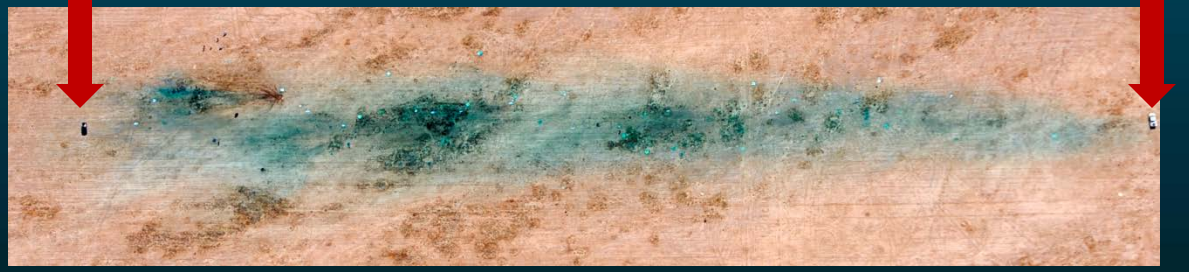
PCADS drop patterns can be linked or doubled due to the number of C-130's dispatched to a wildfire. Unlike any other aerial capability, **PCADS** can be airdropped from multiple C-130's similar to carpet bombing…



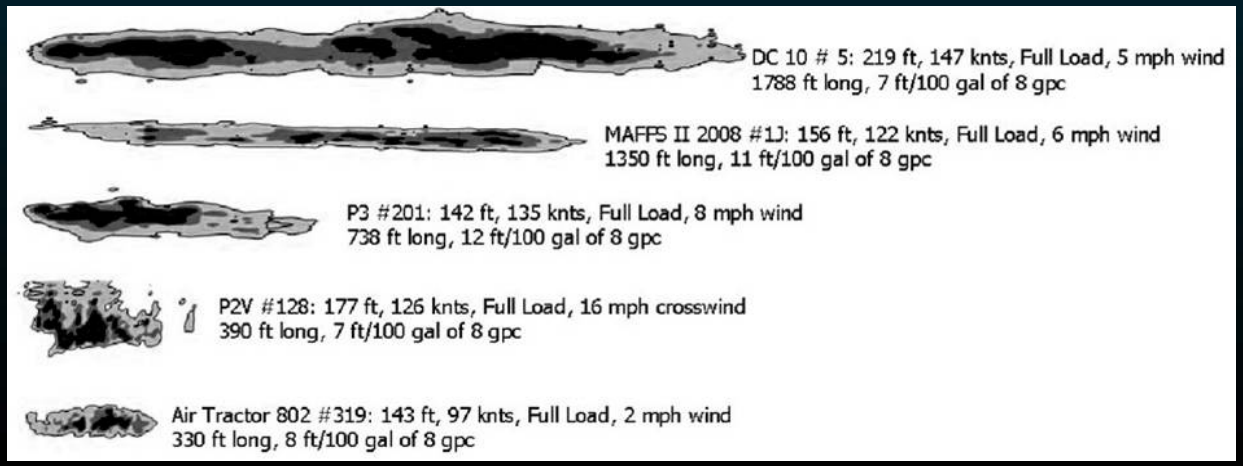
PCADS FLIR AD-10-1173 YPG TW#5 - same as below.
Notice the contrast between hot/cold.

Dodge Full Size/Crew Cab

Ford Expedition



PCADS DROP FOOT PRINT – AD-101173 - 1,369.1 LONG X 213.3 WIDE 202,974 SQ FT 500 AGL 130KNOTS
103.5°F / RH 19.4% / WIND SPEED 1.6 KNOTS / August 4, 2010 YPG



1-PCADS drop at 500' AGL is comparable to a MAFFS II drop at 156' AGL.

Air tankers now in use

Lockheed P2V-7

The P2V-7 dates to 1945 and was among the first aircraft to have both jet and piston engines.

Operator: Minden Air, Minden, Nev.

Water/fire retardant capacity: **2,082 gallons**

Lockheed P2V Neptune

The P2V Neptune, like the P2V-7, was designed to blast submarines in wartime, so it can travel long distances without refueling.

Operator: Neptune Aviation Services, Missoula, Mont.

2,700 gallons

Lockheed P3 Orion

The P3 Orion was the successor to the P2V Neptune in the Navy's arsenal.

Operator: Aero Union Corp, Chico, Calif.

3,000 gallons

Two that could replace them

Bombardier 415 Superscooper

Designed for firefighting, the tanker can scoop a load of water from a lake or other water source in 12 seconds.

Water/fire retardant capacity: **1,600 gallons**

C-130J Super Hercules

A firefighting system would be installed on this military personnel carrier. A pressurized tank would drop water or fire retardant through tubes at the back of the plane.

3,000 gallons

Sources: U.S. Forest Service; Bombardier; Lockheed Martin, Boeing; Neptune Aviation; Aero Union; P2V photo by Steve Bowyer. The Washington Post. Published on June 12, 2011, 9:56 p.m.

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The U.S. Forest Service's air tankers, the giant planes that drop huge loads of water or fire retardant on wildfires, are an average of 50 years old according to a 2009 Department of Agriculture report. These are the air tankers the U.S. Forest Service now uses — all similar in design.

PCADS: 3,500+ Gallons of Gel Direct Attack

PCADS C-130 – 3,500 USG – Gel Drop – Yuma Proving Ground (YPG-2010) 500 AGL

PCADS Status *Today*

- 2009-2012 **PCADS** has been testing with the NSRDEC Aerial Delivery Team and Air Mobility Command USAF certifying **PCADS** for operation on ANG and AFR C-130 and C-17's.
- PTP / Flight Certification signed off by ATTLA/AMC September 2012.
- **PCADS** Team has successfully tested **PCADS** to USAF criteria and have air dropped over 500 **PCADS** with 40 air lifts and over 80 air drops ranging from 1 to 16 PCADS per air drop.
- 1 Million pounds of cargo, 900,000 lbs water or 108,000 USG of water and fire fighting gel have been successfully airlifted and air dropped.
- **PCADS** is 100% proficient in operation and deployment.
- **PCADS** is SAFE and allows aircraft to fly at higher altitudes.

Scheduled for Operational Testing and Use with ANG and USAF in Spring 2015

Next Steps

- **PCADS** is ready for Deployment and Operation Globally.
- Provides Countries with their own aerial firefighting capability.
  - Inventory of **PCADS** throughout the regions
  - Quicker response times
  - Direct attack combats wildfire growth potential
  - Save loss of land, property, time and lives

PCADS
Advantages

Existing aircraft predominantly release retardant agents mixed in water. **PCADS** can not only carry retardant, but also can carry direct attack agents such as gel and foam. **PCADS** affords the opportunity to directly attack wildfires and extinguish them in much shorter time intervals. This result limits wildfire damage to forests and the environment, man-made structures, and human lives.

PCADS allows unique military capabilities to be brought to bear on wildfires such as thermal imaging devices to find hot spots and Global Positioning Systems (GPS) for extremely accurate targeting. Because of its standard design, **PCADS** may be utilized by Governments around the world to extinguish wildfires.

Learn More at:
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