Aerodynamic decelerators

by the **AIAA Aerodynamic Decelerator Systems Technical Committee**

In a particularly busy year, the aerodynamic decelerator systems community touched a broad range of disciplines and attained several major milestones.

DOD airdrop programs

Airdrop systems such as JPADS (Joint Precision Airdrop System) have saved lives and had an enormous impact on current operations, while the push for increased accuracy, higher reliability, larger and lower payload weights, and lower cost systems continues. JPADS encompasses a family of systems being created through numerous efforts, partners, and funding sources. All efforts are managed and executed by a joint team from the NSRDEC (Army Natick Soldier Research Development and Engineering Center), Product Manager Force Sustainment Systems, Air Force Air Mobility Command, Deputy Under Secretary of Defense for Advanced Systems and Concepts, Joint Forces Command, Transportation Command, Marine Corps, Special Operations Command, and others.

The JPADS family consists of "self-guided" cargo parachute systems, a common mission planning and weather system, and navigation aids for Military Free Fall parachute systems. The 700-2,400-lb variant entered Milestone B in March; the 5,000-10,000-lb variant transitioned from a very successful advanced concept technology demonstration to a formal Program of Record (POR), with MS-B approved in August. The formal Capability Development Document for both increments was approved by the Joint Requirements Oversight Council in March. The 2-klb POR is developing the Firefly system from Airborne Systems of North Am ica and will be entering developmental test by year's end. The 10-klb system will be cho after the submission of this annual report.

The JPADS Mission Planner provides computed aerial release point calculations for updating missions to the SCREAMER system, which has been used in Afghanistan since 2006.

The USAF and USA have been using JP in Afghanistan and Iraq. Primary airdrops using the JPADS Mission Planner developed Planning Systems and the Charles Stark Dra Labs. The system is providing improved co puted aerial release point calculations for tra tional "dumb" parachutes for Army high-a tude airdrops and for updating missions to Strong Enterprise SCREAMER system, wh has been used in Afghanistan since 2006. JP airdrops have been documented as sav warfighters' lives in emergency resupply m sions and are being used at a rate of appro mately 500,000 lb per month.

Continued use of JPADS for logistics re ply is expected as the systems have reporte eliminated the need for hundreds of conv and thousands of soldiers from the ro (which pose IED exposure risks) and many copter resupply missions. Large quantitie JPADS-type systems and capabilities are pected to be rapidly fielded for use in the operations in the near future because of t demonstrated positive impact and rapidly proved technology readiness level.

The Low Cost Airdrop System is a r fielding program that explored and fielded merous low-cost, one-time-use, very-low tude airdrop systems weighing from 50 to lb. This system was fielded to theater and is being used extensively to support small-s units with enormous success. Systems are utilized from as low as 150 ft above gro level, and thousands of pounds of supplies been airdropped.

NSRDEC is executing a 30,000-lb A Technology Objective and has demonstr deployment and autonomous control of largest parafoil system ever deployed (9 ft²), with Airborne Systems North Am Wamore, and Draper Labs. This system scheduled to be demonstrated to an inte tional audience in October.

NSRDEC executed a Precision Air Technology Conference and Demonstra (PATCAD) in October at the Army Yuma ing Ground. PATCAD 2007 demonstrate different systems utilizing five aircraft wit lifts over three days. More than 140 cargo drops took place, with weights ranging fr lb to 30,000 lb, for a total of over 300,0 dropped. Numerous Special Operations mi free-fall systems were demonstrated.

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