The U.S. Army Logistics Innovation Agency (LIA), through its Freedrop Packaging Concept Project (FPCP), has made significant strides in the development of the Freedrop Delivery System (FDS) as part of the Army’s Integrated Logistics Aerial Resupply concept.

Understanding the growing importance of aerial delivery operations to supporting and sustaining the force, LIA has worked diligently over the last several years to play a contributing role in the development and advancement of many aerial delivery systems. Past capabilities that LIA has supported and that are currently in widespread use in theater include the Joint Precision Airdrop System, the Low-Cost Aerial Delivery System (LCADS), and the Low-Cost Low-Altitude (LCLA) parachute system, which LIA conceptualized, spearheaded and transitioned to the Product Manager Force Sustainment Systems (PMFSS).

Top, a C-23 Sherpa aircraft deploys four packages using the Freedrop Delivery System, one of the resupply concepts the Logistics Innovation Agency is developing to support and sustain the force. Above, Ugandan soldiers recover a freedrop delivery deployed from a helicopter during a training exercise.

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In an effort to add more aerial delivery capability to the combatant commander’s arsenal, LIA’s FPCP team has been actively exploring freedrop (using no parachutes) as another potential capability in the LCADS suite of systems. In fact, the FPCP is a continuation of the LCLA project that LIA began several years ago but that focused exclusively on developing and fielding an inexpensive, disposable, one-time-use parachute system. Once LIA had successfully tested the LCLA parachute system, deployed it to Afghanistan in support of our combat forces and subsequently transitioned the LCLA capability to PMFSS, LIA then began to investigate the potential of developing a freedrop capability that could be used to support operations in Afghanistan.

The FPCP team began the project by investigating and testing the viability and practicality of a new and innovative sheet-folding technology, which calls for folding paper in chevron patterns to absorb more energy with less volume of energy-dissipating material (EDM). This innovation, which is significantly different from the standard honeycomb EDM, was conceptualized by members of the Department of Industrial and Systems Engineering at Rutgers University. In its most basic form and application, this process entails folding flat sheets of paper into variations of three-dimensional chevron structures. These folds have proven to be extremely effective in absorbing impact energy without subjecting supplies to high acceleration forces and damage. (The FPCP team has also investigated and successfully tested the use of honeycomb EDM variations to achieve project goals as well.)

One goal of the FPCP has been to provide an innovative, reliable and inexpensive freedrop capability that units can use at the operational and tactical levels to support and sustain small-unit operations in austere, unforgiving and remote operational areas like Afghanistan. To this end, the FPCP team has been highly successful in its efforts, proving through a series of rigorous developmental and operational tests (DT/OT) that the capabilities of the FDS can meet these challenging goals. More specifically, FDS test results revealed a number of important findings.

The structural attributes and integrated design of the FDS successfully protect a range of cargo from any damage that would preclude its use or consumption by units or soldiers in accomplishing their missions. The survival rates of all supplies dropped have consistently and reliably exceeded 95 percent. Of the 230,360 rounds of ammo that have been dropped during FDS tests at the U.S. Army Aberdeen Test Center (ATC), Md., only two .50-caliber rounds could not be test-fired by the ATC as a result of damage. Other supplies that were dropped in the FDS routinely approached 100 percent survival rates. Supplies that were
The FDS can be successfully and safely dropped at altitudes of up to 90 feet above ground level and at airspeeds of up to 120 knots. This enables it to be deployed from fixed-wing aircraft, a key requirement of the U.S. Army Special Operations Command.

The FDS can be deployed from a variety of both rotary and fixed-wing aircraft. To date, the system has been deployed from the UH-1, OH-58, UH-60 and Mi-17 helicopters, as well as the C-23 Sherpa fixed-wing aircraft. These particular events included FDS operations and training support to the parachute riggers and pathfinders of the 197th Special Troops Company of the Utah Army National Guard (ARNG), the 294th Quartermaster Company of the West Virginia ARNG, the 2/19th Special Forces Group (Airborne) of the Texas ARNG, the 2/19th Special Forces Group (Airborne) of the West Virginia ARNG, and the 5th Quartermaster Company located in Germany.

Multiple FDS systems can be deployed from fixed-wing aircraft on a single pass over the drop zone. This enables a significant amount of supplies to be dropped in one pass on a very small drop zone with great accuracy and tight dispersion. This in turn makes recovery and distribution of the supplies simple and fast for soldiers and small units on the move. This type of airdrop support is not always practical or achievable with parachute systems, especially when drop zones are very small and hard to reach, like some in Afghanistan.

Building on the success of what has been achieved to date, the FPCP team is now working to improve the FDS capability in support of the stated requirements of our operational partners. Efforts to make the FDS more user-friendly include:

- Developing an FDS collapsible outer box so that transport and storage costs can be substantially reduced.
- Integrating FDS handles or grips to make DZ recovery operations faster and easier for the soldier.
- Assigning National Stock Numbers to individual FDS components so that units in the field can order them through the standard supply system as requirements dictate.

The use of the FPCP team’s FDS capability is not limited to U.S. forces. In 2011, the team deployed 72 systems in support of U.S. Army Africa’s (USARAF) Atlas Drop 11 exercise in Uganda. Not only were the systems used to deliver critical supplies to the Uganda People’s Defense Forces (UPDF) during this important interoperability exercise, but also an additional 25 systems were left behind for operational use by the UPDF. In February, the FPCP team again supported USARAF by providing 48 systems in support of Atlas Accord 2012 in Mali, Africa. Again, 20 systems were left behind to support Malian units in real-world missions.

The FPCP Team currently anticipates that the major ongoing work of the project should be completed and delivered to the appropriate stakeholders by the end of this year.