ASC ENGINEERING FACT SHEET

... An Engineering Success Story

On-Board Oxygen Generation System Development

F-15C/D LOX Vs OBOGS Deployment

18 to 24 Aircraft Squadron

LOX Deployment

3-5 Pallets (463L)

- 4-6 Gallon LOX Carts
- 6-8 Spare LOX Converters
- 1 Gas Oxygen Bottle Cart
- 1 Purge Kit

OBOGS Deployment

1 Pallet (463L)

- 1 OBOGS Tester
- 3 Spare OBOGS

DESCRIPTION

Currently, most USAF aircraft use liquid oxygen (LOX) systems to support the crewmembers for altitude protection. Aircraft systems incorporate LOX converters, which are steel spheres with an evacuated annulus, to keep the LOX supply insulated from

SUMMARY

Problem:

- Air Force fighter aircraft supporting rapid deployment operations must often deploy on short notice to locations throughout the world. Past operations, such as the NATO forces Operation Allied Force campaign against Serbia, have shown that the logistics footprint for existing liquid oxygen systems is unwieldy and expensive. Portable liquid oxygen generation plants are large and expensive to operate. Also, as indicated by the Operation Allied Force experience, establishing such a plant is not the first choice to bring liquid oxygen (LOX) supply to the front lines. The alternative is that 400-gallon LOX tanks are shipped to many locations throughout Europe.

Solution:

- The Air Staff put together an oxygen systems integrated product team to look into On Board Oxygen Generation System (OBOGS) technology as a means to deploy fighter aircraft more effectively and with less cost. The crew systems branch, ASC/ENFC, is supporting this ongoing effort to look at the feasibility of retrofitting OBOGS on existing USAF fighter aircraft. An initial study of fighter aircraft operations concluded that OBOGS would enhance rapid deployment operations.

warmer ambient temperatures. Even though every attempt has been made to insulate LOX in these containers, crew oxygen use, boil-off, and overboard vent of LOX require the converter supply to be replenished daily on fighter and attack aircraft.

Since the mid 1950's, this need to replenish LOX on our military aircraft has evolved a large and expensive infrastructure. It now costs the USAF many millions of dollars every year to maintain this infrastructure. A new technology known as "On Board Oxygen Generation Systems (OBOGS)," has been developed and refined to the point that it is ready for installation on our aircraft. Current designs allow this technology to be applied to fighter, attack, trainer, and bomber aircraft with less than ten crewmembers.

In the Operation Allied Force campaign, a liquid oxygen supply was not readily available at operational locations. Four-hundred-gallon portable tanks needed to be transported throughout remote locations in Europe, where portable liquid oxygen production plants could not be economically transported or operated. When the LOX supply was expended, more tanks needed to be moved in.

ASC/ENFC's support of an Air Staff study showed that the OBOGS technology would significantly reduce this problem and enhance the AEF Air Force in future conflicts. The F-16 System Program Office has led the way in developing OBOGS technology, which is now being used in new production F-16 aircraft. ASC/ENFC actively participated in this development, as well as in flight test verifications at Edwards AFB, CA. Additionally, OBOGS technology has been fielded on F-15E, F-22, B-1B, T-6A and B-2 aircraft. Lessons learned from current operations have been used to develop a much-improved OBOGS.

The Air Staff is now studying to determine future aircraft OBOGS needs as well as potential retrofit to existing F-15C/D, T-38, A-10, F-117 and F-16 aircraft. Data collected on deployments of F-15E aircraft show that OBOGS improves deployments by reducing the logistics footprint. In the near term, OBOGS is under preliminary development for retrofit in Air National Guard F-16 and A-10 aircraft.

Our active participation in the Air Staff study and in the development of the F-15E and F-16 OBOGS has paid off by significantly reducing the required logistics footprint and improving aircraft reliability and maintainability. OBOGS is especially well suited for today's Aerospace Expeditionary Air Force.

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