Success Story:
Korean Aerospace Industries

Markets Served
Aviation, Government & Military

Eaton delivers more hydraulic power to Korean Aerospace Industries T-50

Location:
Korea

Segment:
Military Fighters

Problem:
To design a fast-responding emergency power system (EPS).

Solution:
A 270VDC High Power Brushless DC Motorpump.

Results:
An emergency power system that is significantly simplified with improved performance.

Bearing close resemblance to the F-16, the T-50 supersonic trainer was developed by Korean Aerospace Industries (KAI) in partnership with Lockheed Martin.

Background

Developed for the Republic of Korea Air Force (RoKAF) the T-50 is designed to train pilots of the next generation fighter aircraft including full digital fly-by-wire fight controls and relaxed static stability.

The T-50 is the world's only high performance, supersonic trainer in production today. This advanced jet trainer has attained several technical milestones, including reaching maximum load factors, and maximum operating speed, beginning stores separation.

Challenges

Modern combat aircraft incorporating relaxed static stability with fly-by-wire (FBW) flight control systems require uninterrupted electric and hydraulic power to maintain controlled flight. This requirement has brought more sophisticated secondary power system designs with better emergency power provisions. Although optional for dual engine aircraft with dual redundant power systems per engine, a fast-responding emergency power system (EPS) is mandatory for single engine, FBW aircraft including the T-50.

General requirements for the EPS of today's fighter aircraft are:

- Fast Start Up - The EPS typically starts up and provides full power within seconds.
- High Capacity - The EPS is capable of operating throughout the full aircraft flight envelope and has sufficient capacity to land in the event of a non-recoverable engine failure.
- High Power - The EPS provides sufficient power to cover hydraulic-transient loads associated with bringing the aircraft under control and landing in the event of an engine-out landing.

Solution

The KAI worked with Eaton and other suppliers in the design of a system that is a self-contained, stored-energy system that simultaneously provides hydraulic and electrical emergency power.

Eaton supplies the 33kW Air-Cooled Brushless DC Motorpump and the High Power Air-Cooled Power Electronics Controller for the EPS.

The 270VDC High Power Brushless DC Motorpump is a new design for Eaton. The motorpump is designed for 20 mins of operation and the peak power output is 16 gpm at 3000 psi, which delivers more

EATON
Powering Business Worldwide

Eaton Corporation is a diversified power management company ranked among the largest Fortune 500 companies. Eaton is a global leader in electrical components and systems for power quality, distribution and control; hydraulics components, systems and services for industrial and mobile equipment; aerospace fuel, hydraulics and pneumatic systems for commercial and military use; and truck and automotive drivetrain and powertrain systems for performance, fuel economy and safety. Eaton has approximately 70,000 employees and sells products to customers in more than 150 countries. www.eaton.com

©2011 Eaton Corporation, All Rights Reserved, Printed in USA,
Publication No. CFS100-2B, January 2011

hydraulic power than the Airbus A380 electric motorpump.

Results

The new emergency power system is a significantly simplified system with improved performance and much lower life cycle cost compared to existing propellant stored energy systems.

Eaton
Aerospace Group
9650 Jeronimo Road
Irvine, California 92618
Phone: (949) 452 9500
Fax: (949) 452 9555
www.eaton.com/aerospace

© 2011 Eaton Corporation
All Rights Reserved
Printed in USA
Publication No. CFS100-2B
January 2011

Note: Features and specifications listed in this document are subject to change without notice. Although every attempt has been made to ensure the accuracy of information contained within, Eaton makes no representation about the completeness, correctness or accuracy and assumes no responsibility for any errors or omissions.

Powering Business Worldwide