

Client Study: Flight Refuelling Limited

Flight Refuelling Limited

Flight Refuelling Limited (FRL) and sister company Sargent Fletcher Inc, form Cobham Air Refuelling & Auxiliary Mission Equipment Division. The division has over 50 years experience as a specialist providers of systems and services to world aerospace and defence markets.

Founded in 1934, FRL was created to develop and test aerial refuelling concepts. FRL is today a £100m business, and a substantial part of the £1billion Cobham business.

FRL specialises in the design, test and manufacture of state-of-the-art aircraft Auxiliary Mission Equipment, Marine Products, Air Traffic Control Systems, and has developed the most technologically advanced Aerial Refuelling Systems in the world. With its unparalleled reputation for quality, reliability and after sales service, it offers first class support throughout the lifecycle of all its products.

FRL's customers include Airbus, Boeing, EADS, Lockheed Martin, SAAB and the World's Military Forces.



World-leading wing & fuselage mounted in-flight refuelling systems

The challenge

In 1987 Flight Refuelling Limited (FRL) commenced a major re-development of its air refuelling system for the USAF-KC10A tanker aircraft.

In order to improve the flexibility of the system, and allow it to be easily tailored to meet the needs of other airforces and aircraft, FRL decided to implement the world's first microprocessor controlled air refuelling system.

FRL itself lacked the necessary experience to develop safety-critical software, which would be subject to FAA approval, and so selected IPL as a software development partner.

The solution

The refuelling system consists of two main elements; a Refuelling Pod Controller and a Control Panel, both based around 8031 microcontrollers. The Refuelling Pod Controller handles the trailing and rewinding of the hose and regulates fuel flow and pressure during refuelling operations. The control panel allows the operator to control the pod and provides feedback on refuelling progress and pod operation.

IPL took full responsibility for all software development and quality assurance aspects of the software. Rigorous verification and testing techniques have ensured that potential problems are discovered early and fixed long before each system reaches the flight trial stage. This has ensured that during flight trials risk is minimised, and valuable (not to mention expensive) flight time is not wasted.

Since the initial development IPL has continued to act as FRL's software development partner for its air refuelling systems. This included major development work on substantially updated refuelling systems in 1999 and 2003 as well as adapting and enhancing the existing systems to suit a number of different tanker aircraft. IPL has mapped its own Software Code of Practice to DO-178B (SIL 4 equivalent) to ensure that this work could be carried out successfully.

The highlights

The use of IPL's expertise and software development skill has enabled FRL to maintain its position as world leaders in the air refuelling arena. The systems IPL has worked on are recognised as the most technologically advanced air refuelling equipment in the world.

IPL software plays a major part in ensuring that FRL's air refuelling systems can easily be adapted to suit the multi-role capabilities required by today's airforces. The latest systems can handle the refuelling needs of the full range of receiver aircraft, from helicopters to supersonic fighters, on the same mission with no need for manual reconfiguration.

FRL's long-term partnership with IPL has allowed FRL to maintain a flexible development team that can be sized to suit its on-going development requirements.

Following the success of the initial development FRL adopted IPL's Quality Management System (QMS) to help improve the standard of its own software developments in other product areas.

About IPL

Founded in 1979, IPL has a long history of successfully delivering excellent value consultancy and end-to-end solutions to both the public and private sectors.

IPL's consultancy is renowned for its quality and value. Our consultants are talented and independent-minded individuals with extensive industry experience. We consistently exceed our clients' expectations through a combination of imaginative thinking, managerial and technical expertise and many years of systems engineering experience.

IPL's track record in end-to-end solutions development is exceptional. Our proven development methodology allows us to cut through technical complexity, manage risk and completely focus on delivery. We consistently deliver reliable, efficient and accurate systems to a precise schedule.

IPL is an ISO9001:2000/TickIT registered company having a permanent workforce of 240, revenues of ca. £21M p.a. and 40,000 sq ft of secure office space in central Bath.



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