

AERALIS – An Opportunity for Generational Change in the Training of Fast Jet Pilots

An interview with Air Vice Marshal
Mark Green (retd) CBE



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As AERALIS' Senior Military Advisor, Mark supports the development and implementation of the Programme's Business Plan, the design and development of the AERALIS aircraft and all elements of the training system.

Mark's first flying tour in the Royal Air Force was as Qualified Flying Instructor at RAF Valley on the Hawk TMK1. He went on to fly the Harrier, Tornado and Jaguar before returning to RAF Valley as the Station Commander and Chief Flying Instructor. He held Central Flying School's A2 flying instructional categories on the Hawk and Harrier and was also the CFS Agent for the Harrier Force. His staff appointments included Director of Flying Training and Air Officer Commanding 22Gp. He worked on the Joint Strike Fighter Programme for some 10 years, responsible for authoring the UK's requirement through to becoming the Project Team Leader and procuring the first UK aircraft. After leaving the RAF in 2014, Mark joined Lockheed Martin as their Business Development Director for Global Training Systems.

Mark joined the AERALIS Team in 2019. His experience in the RAF at literally all levels of the flying training system (from student to Air Officer Commanding) together with his acquisition and latterly commercial experience in industry, makes Mark uniquely qualified to support all elements of the AERALIS programme.

Q: You have raised the issue of the need for 'generational change' in the training of fast jet pilots - why do you think this is required?

A: Since 1916 when Major Smith-Barry masterminded a ground-breaking approach to flying training methods, flying training can be characterised as a number of series-based courses with hard boundaries. This very linear process has increasing complexity with the student being exposed to a number of different platforms, each being harder to operate and the environment becoming more complex until the student has reached their frontline aircraft.

I started my flying training in the Royal Air Force in 1980 and the structure of the training then was something that Major Smith-Barry would recognise. Even today, in the UK, the approach is still essentially the same as my experience and to that of 1916. Students learn to master 3 types of aircraft. It's a safe and steady progression through increasing complexity but it fails to capitalise





on the advances that have now been achieved in synthetics, aircraft flight and aircraft operating dynamics. In addition, the major advances regarding the accessibility of learning that are enjoyed today in schools, colleges and universities around the world are not found in military training systems. Furthermore, the cost of operating 3 bespoke fleets of training aircraft with their associated set of flight training devices, courseware, and aircraft integrated logistical support does not represent good value for money. Add into this mix the challenge of recruiting, training and retaining the flying instructors at each level of training and one might come to the conclusion that the present systems, which can be compared to those that were created over 100 years ago, are simply not relevant and not sustainable into the future. This is why a generational change in flying training is required.

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Q: Why does AERALIS offer the potential for generational change in flying training?

A: Imagine a flying training system with one aircraft type and a single suite of flight training devices, integrated logistics systems, maintainers, qualified ground and flight instructors. Such a system would allow students to start their elementary flying training and then, due to the lack of boundaries between each phase of training, to progress as quickly as their competences allow. No longer would they be fixed by their course start and end dates or, indeed, by the need to progress all the course members at a similar pace. Imagine the ability to flex instructional staff across the entire flying training syllabus as opposed to them being constrained by aircraft qualification to merely a third of the total flying training pipeline. Such a system would represent true generational change in flying training and it is achievable now through the AERALIS programme via the modular and reconfigurable nature of the AERALIS aircraft.

This is because AERALIS can be configured to be a basic trainer or to undertake the advanced trainer role. Importantly, in the reconfiguration, the common core fuselage and associated cockpit are identical. The aircraft systems are identical as are flight training devices and ILS solutions. Consequently, Air Force students and instructors can experience a single blended learning experience, from elementary to fighter lead-in training using one aircraft,

one support solution and one training management information system. It will truly be a generational change.

Q: AERALIS has been described as novel, as a potential disrupter of fast jet design. How will the AERALIS team do this?

A: AERALIS will break the traditional military aircraft cost-curve that has dogged the military aerospace sector for the past 40 years. AERALIS's performance, support solution and certification process has been designed by a small team of aerospace experts who are deeply experienced in the role and have recognised the flaws in the traditional approach to military training aircraft design.

The second factor in AERALIS' ability to disrupt the existing and traditional marketplace is scale. Militaries, with the exception of Nations such as the US, have low requirements for volume aircraft. For example, the RAF has less than 30 Hawk T2 aircraft in their fleet. So, when you build low numbers of aeroplanes, they become very expensive. The approach AERALIS has taken is akin to the commercial approach to aircraft design and manufacture. Using the Common Core Fuselage, the multivalent capability inherent in the design allows the concept to cover multiple roles ranging from elementary/basic/advanced flying training through to a range of aggressor roles.

Thirdly, as I explained before, the aircraft systems across all variants are identical as are flight training devices and ILS solutions. Students and instructors can experience a single blended learning experience, from elementary to fighter lead-in training using one aircraft, one support solution, one training management information system. This approach will deliver financial benefits at least 30% cheaper than competitors within the market.

Q: How will AERALIS help the UK aerospace industry?

A: The UK has become very good at building aerospace subsystems and components for commercial and military aircraft. However, it has unconsciously allowed its full aircraft design, development and production capability to wither. We are the only P5 nation on the EU Security Council that finds itself in this position. Unless steps

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are taken soon, the UK, once a leader in aerospace design and development, is in danger of becoming a second-tier player in this sector and losing operational sovereignty over its military aerospace capability.

AERALIS provides an opportunity to reverse this decline through harnessing the aerospace skills that still exist in the design, development and production community today. By providing a route to revitalising those skillsets, AERALIS will create a pathway for the youth who are interested and excited about aerospace, to find a career from school, through university, through colleges, into a UK design, development and build programme.

Q: How does your military fast jet and training background help the AERALIS team with bringing this project to market?

A: I spent a full career in the Royal Air Force during which time I have been a student, flying instructor, flying supervisor and director of flying training. I have also been the Senior Supervisor for the Royal Air Force Aerobatic Team - the Red Arrows, which was both a massive responsibility but also a privilege. When I left the Air Force, I joined Lockheed Martin for some five years and ended up in a business development role looking after their global training services which supported flying training programmes across the globe. Within that career I gained further experience and visibility of the different approaches, the good ways, the bad ways, the exceptional ways, the ways it can be improved, of how to structure and deliver flying training. It also allowed me to reflect on the lack of change and true innovation in this sector and start to formulate my thoughts on what could make the generational change in flying training that is so desperately needed in order to break the present cost-curve.

Q: You mentioned your previous involvement with the Red Arrows; do you think the Team might fly AERALIS in the future?

A: The Red Arrows are a UK icon and without question there is huge respect for the professionalism with which they approach their task. They represent the best of British and provide benefit to the country at many different levels. We have seen from the reaction to their world tours including the recent missions to China, and last year's US tour, the impact that they make in representing all that is good about doing business with the UK. It is important to note that the Hawk aircraft they operate was designed, developed and built in the UK. The aircraft is 40 years old however and, towards the second part of this decade will need replacement. At that point the UK will be faced with a choice; to replace the aircraft with another British designed, developed and built aircraft or disband the Red Arrows - I don't see the UK accepting a National Aerobatic Team operating another Nation's aircraft. So, what is important for us is to ensure that AERALIS is positioned to be able to provide the UK with a choice to maintain the Red Arrows using a future platform that is British.



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