

By James Careless

THE STATE OF MRO TECHNICAL TRAINING: A CONVERSATION WITH CAE'S SHAUN KULDIP



Shaun Kuldip,
CAE

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According to the training firm CAE, the demand for new MRO technicians will hit the half-million mark in less than a decade. To understand the impact of this demand on the aircraft technician training industry, Aviation Maintenance spoke with Shaun Kuldip, global leader of CAE's Maintenance

Training Centre of Excellence. In this exclusive interview, Kuldip explores the trends driving MRO technical training these days, the new teaching products that CAE is bringing to market, and what's coming next in this training space.

Aviation Maintenance: For context, please tell us about CAE's work in aviation training.

Shaun Kuldip: CAE, the company that trains the most pilots in the world, operates over 70 civil aviation training centers globally. Known for its innovative approach, CAE trains pilots and aircraft maintenance technicians. We also train air traffic controllers and commercial aircraft cabin crew.

AVM: The demand for new MRO technicians going forward is astounding. What is CAE doing to address their varied training needs?

Kuldip: Our 2023 CAE Aviation Talent Forecast predicted a need for 402,000 new maintenance technicians industry-wide by 2032. As a result of the critical need for maintenance technicians we are developing training programs that will spool up technicians more efficiently, leveraging new technologies.

As part of CAE's Ready to Lead Program, we offer a variety of courses tailored towards aircraft technicians to help them improve their leadership skills and support career advancement. This includes CAE's Aviation Interpersonal Management (AIM) course, which gives students the skills and knowledge required in managing people and projects, finance, legal issues, communication, and many other business responsibilities.

CAE teaches entry-level aircraft maintenance technician courses and in-depth initial training courses on specific aircraft. This includes the latest and most technologically advanced business aircraft being built today. Courses range anywhere from a three-day "REALCase" course to five-plus weeks for a full aircraft tip-to-tail initial course.

Our Master Technician Program is geared towards organizations and individuals who seek to attain the highest standards of technical excellence and professionalism in business aircraft maintenance. The innovative program allows technicians to enhance their skills and

competencies on two distinct tracks: Specialist and People Leader. With three levels of achievement — Certified, Advanced, and Master — trainees can reach a Master Technician status in less time than in previous Master Technician career development programs.

AVM: What are the trends driving technical training for MROs these days?

Kuldip: There are multiple factors contributing to the increased demand for maintenance technicians. One is the increase in the average age of the technician workforce leading to waves of retirement, which was accelerated by Covid. The loss of one highly experienced technician cannot be simply replaced with one new technician entering the field.

A seasoned technician in business aviation, with decades of experience on the job, is most likely certified to support, on average, four different aircraft types. In the short term, it would often require four new technicians to replace the one. In the long term, it would take many years for one new technician to gain the same level of on-the-job experience as the ones retiring, creating an ever-growing bottleneck.

AVM: What can be done to address this problem?

Kuldip: The first step in overcoming some of these challenges is exposure. We need to promote aviation maintenance to teens in the pre-college years to better attract the next generation of new aircraft technicians. This is crucial for long-term recovery.

In the interim, the industry must do a better job at retaining talented and experienced aviation technicians and attracting experienced technicians from the military. These veterans could provide a much-needed boost to the business aviation sector, however too many are not made aware of the possibilities and opportunities that exist for them and seek alternative career paths.

Training providers such as CAE also need to produce new and innovative ways to accelerate a new student's ramp-up time to become an "effective" technician that can contribute sooner. How do we cram four years of training experience in two years? This includes leveraging new technologies (VR) that resonate with the youth of today to better retain knowledge.

AVM: Why is the aviation industry finding it difficult to recruit entry-level aircraft maintenance technicians, and what can be done to address this problem?

Kuldip: I think the industry is unfortunately seen as less attractive for new job seekers. Since Covid, the graduation rates at aviation

maintenance technical schools are not keeping pace with the numbers retiring.

A lack of incoming technicians for many years and the retirement of a significant number of long-time technicians has created the perfect storm. The reality is that most future aircraft technicians are not training yet today, which is a problem.

[Fortunately] Media coverage of the current pilot shortage has benefited maintenance technicians as an awareness around the pending workforce shortfall has increased. This is now a topic that all operators are interested in seeing solved and is a topic that government workforce development programs are looking to address.

More marketing and media coverage of the improved wages, number of open jobs, and career progression potential for aircraft maintenance technicians will be necessary to continue to bring eyes to the industry and convince more people to take up the training to begin their path to a license. Government grants or scholarships will also bring in necessary attention and give more access to those willing to join the industry.

AVM: What new approaches is CAE considering to train the next generation of aircraft maintenance technicians?

Kuldip: CAE is exploring new learning methodologies, such as Just-in-Time, that takes long and complex type-specific maintenance initial courses and breaks them down into easily accessible shorter courses that offer training when the technician is ready. This gives technicians time to learn new concepts and practice them on the shop floor before returning to training to learn the next area. This predictable cadence of training offers technicians a clear line of sight on what they will be learning and how their career will evolve.

AVM: Where does virtual reality (VR) fit into your training systems?

Kuldip: CAE is deploying the latest in VR technology and simulation via the cloud on our latest Gulfstream and Dassault maintenance programs for the G500/600, G650, and 6X that allow technicians to experience the entire aircraft in a virtual environment. We are coming up on the one-year mark since we started using VR.

As we gather feedback from our customers on VR, the intent is to roll out across other aircraft platforms. Technicians can perform maintenance tasks in this virtual environment in several teaching modes, including an evaluation mode that allows technicians to measure their skills independently. An instructor-led mode also exists that will guide students through the various steps to perform certain troubleshooting tasks. Technicians can experience the aircraft with no fear of damaging expensive parts or putting wear and tear on sensitive interior components. Maintenance tasks that are safety sensitive or cost prohibitive are now available for technicians to practice as much as they require.

AVM: What about adding artificial intelligence (AI) to your VR training systems?

Kuldip: The future convergence of AI and VR represents a transformative synergy which will revolutionize how we build immersive training and skills-development solutions within the aviation industry. As these technologies continue to evolve in tandem, the convergence of AI and VR is poised to redefine the boundaries of human interaction and pave the way for new and innovative applications across diverse domains within the aviation industry. Aviation is one of the industries where the adoption of emerging technologies is accelerating.

An example of how we may converge AI and VR for maintenance technician training is to improve performance

monitoring and evaluation. Our CAE Rise™ technology uses Metrics-Based Insights (MBI) and telemetry data to show pilot instructors objective data during live training, allowing them to focus on evaluating soft skills.

The technology, which CAE has developed for both civilian and military pilot training, also provides analytics to proactively detect, and ultimately address, emerging safety trends. The technology uses analytics to identify trends and optimize training programs, ultimately enhancing the quality of training and ensuring pilots are better prepared. CAE Rise is currently only being used for pilot training but could potentially be used in maintenance technician training and other programs in the future.

AVM: What will the impact of AI and VR be on the training of aircraft maintenance technicians?

Kuldip: As CAE gains more experience on how to deliver training with these new tools, student retention will continue to improve. Additionally, training times will start to decrease, and this comes at a time when technician demand is growing due to many factors in the aviation industry. Getting technicians trained and back to the hangar floor in less time is a key objective for CAE and VR is one of many tools that will help us do just that.

AVM: How is the MRO market responding to these new training tools?

Kuldip: Customers love being able to bring an aircraft inside of the classroom environment. The special orientation that VR allows makes objectives such as component locations and removal and installation tasks much simpler to deliver.

Students enjoy being able to access parts of the aircraft that they normally would not be able to during routine maintenance. They can explore the maintenance computer and evaluate faults that they may not have on their aircraft.

OEMs have come to expect this level of technology from us and push us to develop further VR applications.

AVM: Finally, what's new and on the horizon for aircraft maintenance technical training?

Kuldip: Modern day aircraft have advanced technologically whereby integrated systems now talk to each other and can to a great degree, assist technicians in the troubleshooting of aircraft issues in an automated manner. One such system is the "Centralized Maintenance Computer", a highly complex system that is difficult to teach without the use of simulation.

CAE's high-tech capabilities are an important element to effectively teach the maintenance of today's modern aircraft. The use of these tools is integrated through many of our courses so that the technician is very familiar with its use by the end of the class. Trying to work on a modern-day jet without knowledge of how these onboard systems work is all but impossible for almost any modern-day aircraft.

While CAE Rise could potentially be used in other programs in the future, it is currently only being used for pilot training. **AM**

