Why have a simulator?

Simulation for Air Traffic Control training

Augmenting Air Traffic Control training with the purchase of a simulator is one of the most important decisions you'll make as an ANSP.

Without simulators, training and testing are impossible. Through simulation you can achieve the closest experience to genuine ATC operations. In an operational improvement capacity, statistical analysis and modelling made possible by simulators create accountability for updates to operational procedures amongst staff.

If operational procedures are not optimised in advance, airports, airlines and downstream stakeholders can expect anything from disruption and closed airspaces to negative financial outcomes and a tarnished reputation.

Simulators provide a barrier of protection for operational re-engineering and have become an invaluable tool for research and development. They reduce cost, improve efficiency across the business, and are increasingly used to address complex operational challenges.

The versatility and capability of modern simulators and their daily applications were inconceivable even a decade ago.

Simulators can be a significant investment requiring due consideration. However, now is the time to hold simulators in the same regard as airport surveillance and information security systems. They are a cornerstone of successful ANSPs and should be an immovable item in your critical equipment list.

Key to your future success is understanding how your organisation would like to use a simulator.

Why you might need a simulator

Today's operating environment is safety-first and highly complex — resulting from a shift in thinking over the past two decades. Since then, demand for simulators in a training and system verification capacity has increased rapidly.

Several underlying factors have been key to this paradigm shift, including:

- A preference for end-to-end operational training set in a realistic environment and accompanied by operational hardware
- Opportunities for research and development in any airspace or airport improvement projects
- A drive for operational resilience and a need to validate operational system changes
- Third-party system integration for testing and fault finding
- The testing and verification of business rules
- Data flow verification for the 'system of systems'
- Meeting new regulatory requirements

There is now an appropriate demand for operational resilience in Air Traffic units. As such, the business case for simulators has become indisputable for modern ATM operators.

What should an Air Traffic Control simulator offer?

So, what does an Air Traffic Control simulator need to do to meet expected industry standards?

Drive Successful Training Outcomes
Become a key training and testing tool that meets operational and developmental objectives. For Air Traffic Controllers in training, simulators should provide an immersive, measurable, and constructive training environment.

Reduce Costs
Reduce training and operational costs through improved training and rating times to the point where it becomes the *de facto* method of deploying people and procedures into any operation.

Enhance Ongoing Performance
Provide an ongoing outlet for enhancing existing skills, and learning new ones, in real-world situations. There should be capacity for updating training, evaluating core competency, and responding to emergencies and other unusual situations.

Reduce Risk and Delay
Nurture the development of a safe, efficient, and operational ATC environment without impacting daily operations. This reduces risk to downstream services and minimises changes to live operations.

Operations, Engineering, and Testing Tools
Be a vital validation and verification tool for engineers, and provide research and development capability for all stakeholders. Simulators should also allow ANSPs and airports to test and fine-tune new procedures and equipment in a synthetic, high-fidelity environment. All of which result in more efficient deployments.

Meet Regulatory Requirements
Due to the complexity of operational environments, regulatory materials have extensive and detailed requirements; you can only meet these requirements through simulation.

How to procure a simulator

Exploring solutions as complex as an ATC simulator isn't easy. There can be significant advertising material and technical complexity to navigate in order to feel informed.

There are also risks to your purchase, depending on who makes the purchasing decision. If management or technical personnel make the overriding purchase decision, they may purchase without fully understanding the operational requirements. If training personnel take the lead on the purchasing decision, they may do so without a comprehensive understanding of the technicalities of managing and maintaining their new simulator system. At Micro Nav, we endeavour to ensure that you have a total understanding of the system you choose to purchase, with dedicated experts on hand to help you every step of the way.

Above all else, we recommend entering the tender process with a full understanding of your requirements for the system and a clearly defined simulator strategy assembled in collaboration with all relevant departments.

Below, we outline some key considerations you should make when outlining your system requirements and wider simulator strategy.

Purpose
- What do you expect to be the key purpose of your simulator?
- What are you hoping to achieve with your simulator?

Capability
- What tasks does your simulator need to be capable of performing?
- Do you plan to use it for training, operational testing, and process verification?
- How versatile should your system be?
- How many people are you hoping to train at any one time?

Implementation
- Where do you want your simulator to be located?
- What constraints will you face in implementing your simulator?
- Have you considered your preference for monitor-based or projector-based solutions?
- Simulation, emulation, or stimulation?

Maintenance
- How much maintenance will the system require?
- Who would you like to oversee the maintenance of your simulator system?
- What maintenance can you perform in-house, and what maintenance will you need to outsource to your supplier?

Operations
- How do you intend to adapt data in line with operational demand?
- Who will oversee the operation of your simulator?

Quality
- Who will take responsibility for the quality process?
- Are there limitations that may risk safety or constrain throughput?

Suppliers
- Does your supplier have a good reputation and track record for delivery of simulator systems?
- What is the breadth of your supplier capability?
- What after-purchase services can they provide to you?
- How flexible can they be in supporting you on-site?

Cost
- What would be the total life cost of your simulator purchase?
- How can you measure return on investment?
- Is there any flexibility in purchase terms?
- Is there a cost attached to after-purchase services?
- What after-purchase warranty is available on equipment?
- What support is offered over the simulators operational lifetime?
- How future-proof is your system? May you need to purchase additional equipment/software further down the line?

Modern Air Traffic Control simulators are an industry cornerstone for efficiency, operations, and safety.

Without simulator systems for the training of operations and procedures, Air Traffic Control units will accrue greater costs and spend more time implementing operational procedures, implementing new equipment, and introducing new staff.

While there are many considerations and much documentation to appraise, a full cross-department examination of simulator needs and strategy is a prerequisite to a successful purchase and implementation of any new simulator system.

+44 1202 764444
sales@micronav.co.uk
micronav.co.uk

MICRONAV

PART OF QUADRANT GROUP

The Quadrant Group's mission is to make a meaningful positive difference to aviation safety by providing and enabling the world's best-trained air traffic controllers.
We do this by engineering the industry-leading tool for training, development, and operational testing, as well as offering consultancy and support services to assist customers in establishing and running training centres of excellence.